



Supervisory Practices and the Profile of the Ideal Supervisor from the PhD Student's Perspective

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ABSTRACT

Implementing qualification frameworks in response to the Bologna process during the latter part of the 20th century prompted considerable change regarding Higher Education. Such alterations brought up apprehensions concerning the acquisition of competencies following each cycle of studies, as well as the means employed to oversee and assess teaching and learning procedures. The NOVA University of Lisbon (UNL) has recently researched Doctoral Education, focusing on supervisory practices. Since 2018, surveys regarding doctoral supervision have been conducted across multiple schools at UNL. This research report presents an overview of the national numbers regarding doctoral education enrollment, and the results of a study conducted at four schools within the UNL: The National School of Public Health (ENSP), Technological Institute of Chemistry and Biochemistry (ITQB), NOVA Medical School | FCM NOVA, and NOVA School of Science and Technology | FCT NOVA. The study presents data regarding part-time PhD students' and full-time PhD students' views of the supervisor role and focuses on examining the characteristics of an ideal supervisor and the supervision practices experienced by doctoral students throughout their PhD programs. The findings suggested that supervision practices were slightly different considering the type of attendance, the enrolment year (during all doctoral research projects), and the schools' culture and field (Health or Science and Technology). Furthermore, the supervisor's role (mentor or coach) was similar within the school field, but the "ideal" supervisor varied depending on the school attendance type.

Keywords: Doctoral supervision, supervisory practices, supervisor profile, Doctorates.

INTRODUCTION

Over the past two decades, doctoral education has become increasingly important in Europe. As a result of regulations implemented through the Bologna process in signatory countries, such as the qualifications/competencies grids, education has been subject to reflection and questioning across a range of areas. These include the objectives, function, preparation of doctoral students, supervision practices, experiences of doctoral students, socialization processes, Ph.D. design, and employability, among others (Jones, 2013). Many institutions have adjusted their practices during the doctoral program to improve retention rates and completion times. They have also developed strategies to support both doctoral students and supervisors, as well as monitoring and evaluating the implementation of doctoral projects.

Doctoral Supervision

In the past 30 years, the doctorate has undergone significant changes, including formalization, growth, and diversification of candidates, study modes, and purposes, as noted by Taylor (2014,

2016 and 2018). These changes require supervisors to be highly attentive and responsible for meeting the educational needs of their doctoral students. This involves providing exceptional learning experiences, monitoring progress systematically, and adhering to institutional deadlines for completing the Ph.D. Supervisors must also integrate themselves into national and international research ethics and effectively manage interactions with formal and informal co-supervisors. The increasing and diverse Ph.D. student population presents challenges in guiding, motivating, and overseeing larger, culturally diverse groups amidst the increased workload faced by university professors. The students' profile indicates that many are already employed part-time, possess mature outlooks, and rely on alternative technological tools for learning, demanding more time and assistance from supervisors than traditional face-to-face instruction. Taylor (2014, 2016 and 2018) states that the PhD now serves a diverse range of purposes, impacting the practice of supervisors. This includes the possibility of co-supervision within or across disciplines, nationally or internationally, and new forms of PhD programs carried out in industrial or artistic contexts, which require navigating multiple knowledge areas, languages, perspectives, and methodologies. Furthermore, the declining trend of students seeking academic careers and instead pursuing other professional development opportunities has resulted in a greater need for supervisors to possess varied knowledge and skills beyond what was traditionally required.

Meanings of Supervision and Their Implications:

Historically, supervision has been viewed as a task best suited for highly experienced PhDs with a strong research background. The prevailing notion is that those who are skilled at investigating will naturally be able to teach others how to investigate, and as such, supervision has been commonly carried out without any additional training beyond that which is gained through scientific expertise in a particular field. A doctoral degree is often perceived as the ultimate certification for this type of work (Ribau & Alves Gaio, 2017 and 2018; Lee, 2018). The style and functional content of the supervision activity were modelled during the PhD process, by the relation between apprentice/master. Anne Lee pointed out, "There are two key influences on supervisors' approach to supervision: firstly, their concept of research supervision and, secondly, their own experience as a PhD student" (Lee, 2008; 2018). Research provides compelling evidence of the importance of using management techniques in PhD tutoring or guidance. Orozco's study identified three distinct leadership styles among tutors: the authoritarian style, where the tutor dictates everything and expects students to comply; the democratic style, where the tutor engages in discussions, provides feedback, and evaluates progress; and the laissez-faire style, where the tutor gives complete freedom and only provides feedback when requested. Most tutors tend to adopt the laissez-faire style, which is often due to the high number of doctoral students per tutor. Furthermore, studies have shown that leadership styles tend to vary by field of study, with a more authoritarian approach in the exact and natural sciences, and a more democratic approach in the human sciences. Based on Gatfield's (2005) research, thesis completion is determined by three critical dimensions: structural elements, which are agreed upon by the student and supervisor; optional support elements, which can come from either the supervisor or institution and are non-directive; and exogenous elements, inherent to both the student and supervisor, often associated with individual psychological factors. Based on Delany's (2009) research, supervisory guidance relies on the connection between the advisor or supervisor and the supervisee or doctoral student. This suggests that supervision involves a collaborative effort between the doctoral student and their supervisor, to complete the PhD program. The dynamic between supervisor

and supervisee is shaped by principles that guide it toward accomplishing specific goals. According to Halse and Malfroy (2009), key qualities of this dynamic involve friendship and professional rapport built upon mutual respect and trust. A fruitful PhD journey necessitates a shared set of values, expectations, and motivations between advisor and advisee. For Gatfield (2005) the supervisory relationship is often perceived as a power dynamic or a professional agreement that is based on the management of boundaries between the guide and advisee. This viewpoint implies that the supervision process is influenced by the degrees of responsibility and independence given to both parties in the relationship (Gatfield, 2005; Frick and Glosoff, 2013; Overall, Deane & Peterson, 2011). According to Maxwell and Smith (2011), supervision involves modifying the teaching and learning process, personalising instruction, and embracing diversity (including uniqueness, autonomy, and openness). It values in-person and virtual tutoring, effective communication, and the integration of technologies. Additionally, it involves changes in training (both didactic and technological), reflective practice, and collaborative work. However, some researchers view supervision as the role of a discerning ally who provides abundant encouragement and understanding, attuned to the requirements expressed by the supervisor or demonstrated by the doctoral candidate. Under this perspective, the educational aspect of the connection and the pedagogical expertise of the supervisor are strengthened as crucial factors in the quality of the relationship. In this conception, the pedagogical component of the relationship and the pedagogical knowledge of the supervisor are reinforced as a determinant of the relationship quality (Boud and Lee, 2005; Halse and Malfroy, 2010; Åkerlind and McAlpine, 2017).

Several authors have analyzed the various approaches to supervision and found that they result in different conceptions. These conceptions can be categorized into two axes: those that prioritize the product, with the thesis and its intrinsic quality being essential, and those that prioritize the process that leads to the production of the thesis and its results. In the latter approach, the quality of the thesis is a consequence rather than the central focus (Vehviläinen and Löfström, 2016; Åkerlind and McAlpine, 2017; Boehe, 2014). In their 2016 study, Vehviläinen and Löfström highlight two distinct approaches to doctoral supervision: the traditional product-focused perspective and the more contemporary process-focused perspective. They demonstrate that conceptions of supervision have evolved from an individualistic framework - wherein the PhD student and advisor bear sole responsibility - to a more collaborative one, wherein the academic community as a whole share the responsibility within a socio-cultural context. In this approach, supervision requires knowledge and skills from the supervisor as a researcher and specialist in an area of knowledge, as well as in Pedagogy. Supervision is then seen "as a learning" process as well as a participatory process that shapes the identity of the supervisee" and, in this sense, "supervision is a matter of pedagogical choices, rather than merely following the traditions of the disciplinary culture or local routines" (2016:509). This notion of the product process is questioned by Åkerlind and McAlpine (Åkerlind and McAlpine, 2017) to the extent that they consider that the two dimensions are interconnected and construct different supervisory matrices. They consider that in the relationship there is always a conception of "what" (product) and "why" (process), in interaction - Advisor/Advisee - which does not result linearly. It is worth noting that the polarization of this approach often assumes a uniformity of intentions among advisees, which is not necessarily the case, even among teachers. Maxwell and Smith (2011) further reinforce this notion by suggesting that supervision must always consider three key areas: The Process of teaching and learning, the development of the student, and the production of a

product/research project as a social practice and that the importance of each area may vary depending on the project's stage of development, as well as the advisor and advisee's unique characteristics and requirements. According to Halse and Malfroy's (2009) research, it is essential to understand the role of supervisors and how it can be defined, especially with the recent changes in universities and PhD programs.

Doctoral Supervision as A Teaching and Learning Process:

The supervision of doctoral research or thesis can be considered a practice that falls under the umbrella of research pedagogy or doctoral training, depending on the perspective (Huet & Casanova, 2022; Fillery-Travis & Robinson, 2018; Lee, 2018). The common goal, however, is to create a marked pedagogical space where the supervisor aims to facilitate the student's learning, development and completion of their thesis for the degree supervision plays a crucial role in the PhD process as it helps attain specific goals. It is intricately linked to the institutional objectives that shape the program's purpose, as well as the personal goals of those involved, including the advisor or supervisor. At the same time, the advisee aims to shift from being a mere consumer of knowledge to becoming a researcher who produces knowledge. Fillery-Travis and Robinson (2018) state that there is little research on the component of teaching and much less on learning in the area of supervision of PhDs - they argue that the need for pedagogy arises with the modern forms of PhD which there is a context and a specific pedagogy. According to Fillery-Travis, Robinson (2018) and Taylor (2014), the role of a supervisor has evolved to that of a support rather than an expert, recognizing that expertise in a particular area does not necessarily translate to expertise in the profession or specific professional context. This approach aligns with the concept of pedagogical supervision of teaching practices.

While identifying common practices is important, it's also crucial to recognize that these practices are shaped by the advisor's beliefs, conceptions, and perspectives (Lee, 2008; Åkerlind and McAlpine, 2017; Pyhältö, Vekkaila & Keskinen, 2015). Several studies, including those conducted by Latona, K. & Browne, (2001), Brew and Peseta (2004), Pearson, and Brew, A. (2002), Barnes and Austin (2009), Halse and Malfroy (2010), and Halse (2011) as well as Taylor (2012, 2014), have conducted empirical research to identify the challenges and obstacles faced by supervisors. These studies have revealed several barriers, including the doctoral students' expectations and feedback provided by supervisors, institutional requirements and regulations, and the doctoral students' desire to improve performance through the acquisition of knowledge and skills. Some of these problems, difficulties, demands, and interests identified will correspond to possible supervisors' training needs. According to authors like Lee (2009), supervisors should be well-prepared for their roles and possess a thorough knowledge of the areas in which their doctoral students' projects are developed. This will enable them to provide effective support to their students. As Sidhu, Kaur, Fook, and Yunus (2014) point out, PhD students appreciate supervisors who read their work before their meetings, critique their work constructively, are available when students need them, and deadlines should be set so that PhD students take the work seriously. According to research conducted by Meanwhile, Worthington, and Roehlke, and cited by Sidhu and collaborators (2014), PhD students tend to perceive supervision positively when their supervisor provides adequate support, offers prompt feedback, fosters positive interpersonal relationships, and implements structured and education-oriented supervision practices. For Pyhältö and Vekkaila (2012) the adjustment between the perception of supervisors and doctoral students about their roles and the doctoral research process also promotes student engagement and effective

supervision. In this context, the supervisor should support, with his/her experience and knowledge, the student throughout the research process, giving quality feedback promptly, so that the student develops high-quality research skills (Mainhard, van der Rijst, van Tartwijk, & Wubbels, 2009). A proposed strategy for helping PhD students overcome the difficulties encountered during their studies is to provide peer support. This strategy is effective in benefiting both supervisors and students who receive the support, and it allows for better integration of the latter (Mason & Hickman, 2017). Several studies have shown that PhD students recognize the value of engaging in institutional tasks within academia. This not only reinforces their sense of belonging but also contributes to their growth as scholars and researchers, equipping them with skills specific to the natural sciences and adeptness in managing doctoral research and institutional tasks. Collaborative academic settings provide opportunities for crucial learning experiences, such as research activities, training, and peer-to-peer and researcher interactions (Vekkaila, Pyhältö, Hakkarainen, Keskinen & Lonka, 2012).

Supervision Practices

Doctoral supervision, which involves supervision of research projects and theses, can be viewed as a practice that falls within the realm of research pedagogy or doctoral training pedagogy, depending on one's perspective (Manathunga, 2007; Halse and Malfroy, 2010; Huet & Casanova, 2022). Both approaches emphasise the importance of intentionality and purpose in the supervisory process. The supervisor seeks to support the student's growth and successful completion of their thesis to obtain their degree, while the advisee aims to learn how to conduct research and transition from a consumer of knowledge to a producer of knowledge (Fastuca and Wainerman, 2015). The success of a PhD student is highly dependent on the relationship and interaction with their supervisor (Loganbill & Hardy, 1983; Mainhard, van der Rijst, van Tartwijk & Wubbels, 2009). It is vital to provide a learning environment that fosters their development as researchers and deepens their knowledge (Sze, 2007; Malfroy & Yales, 2003, Lee, 2008 and 2009). To achieve effective supervision, it is crucial to establish a good social environment that encourages the doctoral student to creatively build original knowledge based on the research teams they belong to (Cullen, Pearson, Saha & Spear, 1994; Ali & Kohun, 2007; Gardner, 2008 and 2010). It is essential to tailor the supervision practices to the specific needs of the doctoral student and their project (Nakabugo & Ssebunga, 2004). In any research endeavour, it is crucial to have the guidance and supervision of an experienced mentor, regardless of whether the research is aimed at generating knowledge or achieving practical objectives. Providing such mentorship is a complex process, especially when it comes to specialized subject matter like research. Doctoral students, for instance, need to be taught how to approach research, including designing projects, analysing data, reviewing the literature, and sharing findings (Pearson and Brew, 2002).

METHODOLOGIES

National data was collected from an open source, the internet page of "Direcção geral das estatísticas de educação e ciência" (<https://www.dgeec.medu.pt/>), page <https://www.dgeec.medu.pt/art/ensino-superior/bases-dados/todas/652ff89abd5c2b00958292d7> in January 2024. The data regarding the NOVA Lisbon school was extracted from their internet page, <https://www.unl.pt/nova/factos-e-numeros> and <https://www.unl.pt/nova/relatorio-de-atividades-e-contas> in January 2024

An online questionnaire was made available to doctoral students across all schools at UNL. The questionnaire included an inventory of doctoral supervision practices and characteristics of supervisors. It was anonymous and open for three months, from March to May 2018. In total, 243 doctoral students responded, with 25 from ENSP (Escola Nacional de saúde publica), 156 from FCT (Faculdade de ciencias e tecnologia), 21 from ITQB (Instituto de Tecnologia Química e Bioquímica), and 41 from FCM (Faculdade de Ciências Médicas).

RESULTS AND DISCUSSION

PhD in Portugal and at NOVA Lisbon University: An Overview

At National Level:

Since the beginning of this century, the number of students enrolled in PhD in Portugal has grown until 2013/2014, then had a slight decrease, but after 2015/2016 started growing again, Fig. 1.

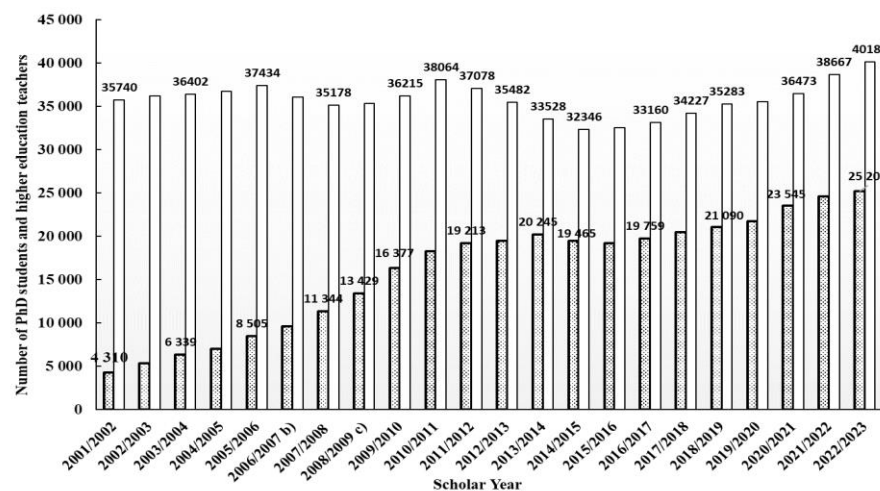


Fig 1: Students enrolled in PhD (▨) and teachers in higher education (□). since the school year 2001/2002. b) Beginning of the Bologna Process (Decree-Law No. 74/2006, of 24 March) c) Beginning of the collection of the Register of Enrolled Students and Graduates of Higher Education. Data Retrieved from <https://www.dgeec.medu.pt/art/ensino-superior/estatisticas/diplomados/652fbe07bd5c2b00958292c9> and <https://www.dgeec.medu.pt/art/ensino-superior/undefined/undefined/657061b5602a6e14599d3922>

Typically, part-time PhD students and mature students bring a unique perspective to their studies, due to their varied backgrounds and experiences in comparison to full-time, younger students. Mature students are often established in their careers or have families and tend to be older. Part-time PhD students, on the other hand, may have to balance their work and other commitments alongside their studies. Strong time management skills are crucial for these students, who must allocate their time effectively between work, family, and research. As a result, flexible scheduling and creative solutions may be required to accommodate their other commitments and meet deadlines and also a change in the supervision practices. In current times, the PhD student population is quite diverse, which also extends to the types of enrolment, Fig. 2.

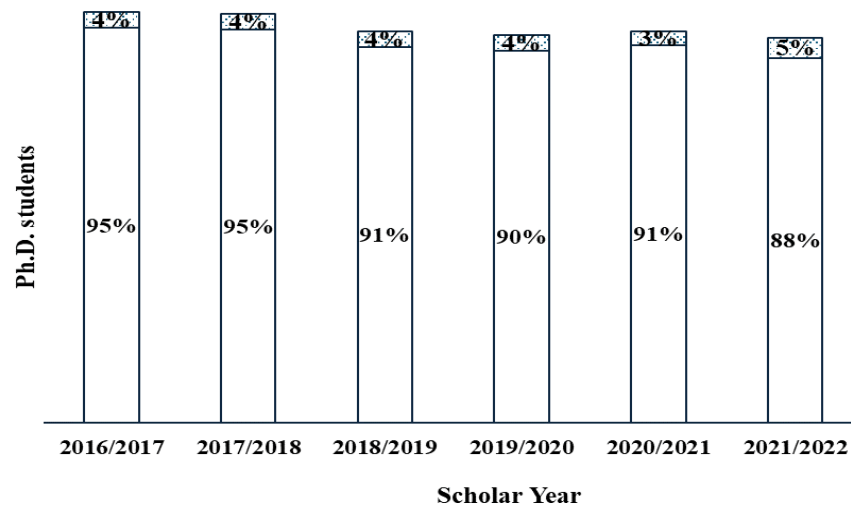


Fig 2: PhD students enrolled in the first year, in Portugal in all scientific fields, since the school year 1996/1997, enrolled in part-time (▨) and full-time (□).

<https://www.dgeec.medu.pt/art/ensino-superior/estatisticas/diplomados/652f89abd5c2b00958292d7>

Figure 2 reveals that the number of PhD students enrolled full-time has remained almost unchanged since 2016/2017. Data indicates that pursuing a PhD full-time after obtaining a master's degree is highly valued by society. The data from “Direção-Geral de Estatísticas da Educação e Ciência” (<https://www.dgeec.medu.pt/art/>), show that the number of students enrolled in the PhD at a national level has grown since 2015/2016 (Fig.1), however, the graduates have not shown the same profile (Table 1).

Table 1: Total of students enrolled in the PhD, graduate students, students enrolled for the first time in PhD, Percentage of students enrolled in the PhD, percentage of doctoral graduated, percentage of students in the 2nd, 3rd, and 4th in attrition (calculated considering the students enrolled for the first time and graduated four years later: (students enrolled for the first time- graduated four years later)/ students enrolled for the first time).data from Tabelas de dados do Ensino Superior (media. pt)

<https://www.dgeec.medu.pt/art/ensino-superior/bases-de-dados/todas/652ff89abd5c2b00958292d7>

Scholar Year	2011/2012	2012/2013	2013/2014	2014/2015	2015/2016	2016/2017	2017/2018	2018/2019	2019/2020	2020/2021	2021/2022	2022/2023
Total of students enrolled in Ph.D.	19 213	19 471	20 245	19 465	19 214	19 759	20 452	21 090	21 764	23 545	24 616	25 202
Ph.D graduates	1 859	2 463	2 503	2 351	2 344	2 135	2 266	2 103	1 941	2 080	2 317	-
Total students enroled for the 1st time	5 251	4 575	4 960	4 622	4 696	5 073	5 456	5 535	5 824	6 193	6 139	6 180
Students enrolled in the 2,3 and 4 year	12 103	12 433	12 782	12 492	12 174	12 551	12 730	13 452	13 999	15 272	16 160	-
Percentage of students enrolled in 1 st year	27%	23%	24%	24%	24%	26%	27%	26%	27%	26%	25%	25%
Percentage of students enrolled in 2, 3 and 4 year	63%	64%	63%	64%	63%	64%	62%	64%	64%	65%	66%	-
Percentage of graduates	10%	13%	12%	12%	12%	11%	11%	10%	9%	9%	9%	
Attrition ("Students who took more than four years to complete their PhD.")				55%	49%	57%	51%	55%	62%	62%	58%	

With the PhD program typically spanning four years, one can calculate the attrition rate (attrition = (students enrolled initially - those who graduated four years later) / students enrolled initially) and observe a consistently high average of 56%, Table 1. This means that 56% of the students who start a PhD can't finish it in the regular time. It should be noted that there are PDs of 3 years, so the attrition is higher than 56%.

At NOVA Lisbon University:

Over the past eight years, the number of students enrolled in doctoral courses at UNL has remained relatively steady, except for a decline in 2014. However, the doctoral population has become more diverse, with students from different countries, and age groups, and with varying circumstances and schedules (as noted by Ribau & Alves in 2017 and 2018).

Considering NOVA Lisbon University, it is possible to collect data from official documents (<https://www.unl.pt/nova/relatorio-de-atividades-e-contas>) and perceive that the attrition is still high (average of 48%), but the number of students entering the third cycle is almost constant (average 23% per year), Table 2.

Table 2: Total of students enrolled in the PhD at NOVA Lisbon University, graduate students at NOVA Lisbon University, students enrolled for the first time in the PhD at NOVA Lisbon University, Percentage of students enrolled in the PhD, percentage of doctoral graduated, percentage of students in the 2nd, 3rd, and 4th in attrition (calculated considering the students enrolled for the first time and graduated for years later: (students enrolled for the first time- graduated four years later)/ students enrolled for the first time). Data from <https://www.unl.pt/nova/factos-e-numeros> and <https://www.unl.pt/nova/relatorio-de-atividades-e-contas>

Scholar Year	Total of students enrolled in Ph.D.	Ph.D graduates	Total students enrolled for the 1st time	Students enrolled in the 2,3 and 4 year	Percentage of students enrolled in 1st year	Percentage of students enrolled in 2, 3 and 4 year	Percentage of graduates	Attrition ("Students who took more than four years to complete their PhD.")
2007/2008	-	152	-	-	-	-	-	-
2008/2009	1600	159	333	1 108	21%	69%	10%	-
2009/2010	2043	182	625	1 236	31%	60%	9%	-
2010/2011	2194	204	517	1 473	24%	67%	9%	-
2011/2012	2 127	200	498	1 429	23%	67%	9%	40%
2012/2013	2 192	191	475	1 526	22%	70%	9%	69%
2013/2014	2 225	238	608	1 379	27%	62%	11%	54%
2014/2015	2 004	244	463	1 297	23%	65%	12%	51%
2015/2016	2 048	245	409	1 394	20%	68%	12%	48%
2016/2017	1 931	301	393	1 237	20%	64%	16%	50%
2017/2018	1 979	244	416	1 319	21%	67%	12%	47%
2018/2019	2 057	248	403	1 406	20%	68%	12%	39%
2019/2020*	2 044	269	489	1 286	24%	63%	13%	32%
2020/2021	2 179	174	571	1 434	26%	66%	8%	58%
2021/2022	2 284	245	476	1 563	21%	68%	11%	39%
2022/2023	2 286	265	562	1 459	25%	64%	12%	46%
Average					23%	66%	11%	48%

*Covid-19 year

From 2012/2013 until 2019/2020 the attrition rate decreased. However, after the pandemic COVID-19 (2019/2020), it increased, as the research projects in many PhD had to stop with the

confinement/ lockdown. Given this context, it is crucial to gain insight into the supervision practices and supervisory profiles before the pandemic and after that. This paper will present the landscape before the pandemic.

The data collected from the four schools at Nova Lisbon University, allows us to characterize the supervision of three of each, as the number of responses is higher than 20%. Data collected from official documents

(https://www.unl.pt/sites/default/files/relatorio_de_contas_2018.pdf, p. 32), indicate that 35% of the Ph.D. FCT students responded, 21,5% of the Ph.D. FCM students responded, and 24,5% of the Ph.D. ENSP students responded, but from ITQB only 7% of the Ph.D. responded.

Type of Attendance: Full-Time Versus Part-Time Students:

The culture of higher education institutions has a significant impact on the supervisory environment and the quality of the supervision process. It affects the way supervisors interact with their supervisees and can shape their perceptions, values, strategies, and approaches towards their supervisory role. A collaborative and knowledge-sharing culture can lead to participatory approaches and a focus on professional development, while a culture emphasizing hierarchy and authority can result in more controlling practices. Institutional policies and guidelines also play a role in determining issues such as frequency and format of meetings, evaluation of performance, and training opportunities for supervisors. The process of socialization and enculturation differ for part-time and full-time students, and supervisors must supervise with different approaches. The two types of enrolment signify doctoral students with varying backgrounds. Full-time students have more time to focus on research, and thus, their supervision must reflect this. Typically, full-time PhD students have had an uninterrupted school career from a young age, which allows them more availability to carry out activities. On the other hand, part-time students have work commitments that limit their availability, and they are generally mature students; they bring a rich diversity of perspectives and experiences to the academic environment, enriching the learning experience for all students and faculty. In this context, it's important to know what enrolment we have in the schools. We should note that this data refers to the PhD students who responded to the survey. The data regarding the type of attendance (full-time or part-time) of respondents PhD students are presented, in Fig. 3.

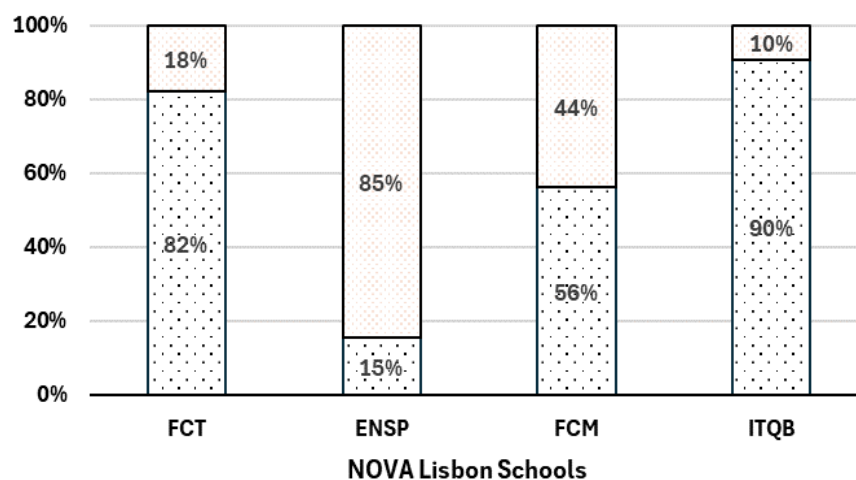


Fig 3: Ph.D. respondents' students who are enrolled in full-time (▨) and part-time (■).

It is important to note that the respondent population from the ENSP is most part-time students, which contrasts with the FCT respondent population and ITQB (Fig. 3) where almost all students are enrolled full-time.

A comprehensive analysis was conducted on ten domains of PhD students with both full-time and part-time enrolment. These domains included Planning, Task Demand, Self-Monitoring, Supervisor Monitorization, Autonomy Development, Communication Skills Development, Tasks Outside of the PhD Project, Socialization Process, Supervision Assessment, and Supervisor Performance as a Guide Project. From the doctoral student's perspective, it is evident that tasks assigned by supervisors differ based on attendance type, whether full-time (174 students) or part-time (70 students), Table 3.

Interestingly, there were no significant differences in the Planning domain among respondents. However, when the tasks (that students must do at the request of their supervisor) were analysed, a difference emerged as 44% of part-time students reported that supervisors asked them to write the thesis simultaneously with the research project development, and this only happens with 22% of full-time students' enrolment. The request to write papers at the end of each year is highlighted by 36% of students on time part-time but only 22% of full-time PhD students. On the other hand, 20% of the supervisors ask full-time students to write the thesis at the end of the research period and only 9% demand the same from part-time students. Lee, Kamler, Wellington, and Lindsay (2008) consider the issue of teaching the PhD student to write the thesis and articles as one of the assignments/obligations of the supervisor that must be practised regularly. Research on the continuous model of thesis writing highlighted that this is a production of knowledge that can support the PhD student in your doctoral pathway and help or monitor your PhD work (Lee & Kamler, 2008; Wellington, 2010; Lindsay, 2015). As Lindsay says "Serial writing allows the writer to work to a pattern that ideally suits their working and social environment, with the latter sustaining the writing process and not undermining it." (Lindsay, 2015: 185). It should be noted that Murray (2011) considers serial writing "critical for the development of our thinking through writing". The writing of the thesis is a task that for Kamler and Thompson (2006) is one of the key pieces for the formation of the identity of the doctoral student as "the scholar or researcher", it is very important to evaluate the work of the doctoral student during the doctoral journey. Writing should take place throughout the doctoral course (and not only at the end), as it is a learning process (which implies advances and setbacks in the construction of knowledge), but it is also one of the bases for the construction of the doctoral student's identity. It can be seen because of this work, that this perception is not transversal to all supervisors, but it exists.

Monitorization and self-monitorization of the research project are essential to balance the planning and the concretization/operationalization of it. A person with metacognition possesses the ability to reflect on their own thought processes, understand their own cognitive biases and limitations, and actively engage in self-monitoring and self-regulation of their thinking. They can identify errors in their thinking, adjust their strategies to improve their problem-solving abilities, and have a strong awareness of their own strengths and weaknesses in terms of cognitive abilities. They also tend to be more adaptable, open-minded, and able to learn from their experiences. The data allow us to perceive that monitorization is not a practice that are done usually by students or supervisors. Only 28% of the PhD students enrolled in full-

time report the use of a self-monitorization technique, and 53% assign supervisor monitorization, Table 3.

Table 3: Inventory of practices. Tasks carried out during the PhD project. The statement that was made was: "My supervisor or co-supervisor asked me (asks me) to...Percentage of Ph.D. students on part-time, full-time attendance, who assigned the supervisory task/practice.

Domains	My supervisor or co-supervisor asked me (asks me) to...	Part-time	Full-time
Planning	... plan my research	49%	43%
	... write the thesis over the research period	44%	22%
	... write my thesis at the end of my research	9%	20%
Tasks demand PhD students	... whenever we meet, a written record should be made of the topics discussed	11%	13%
	... prepare a portfolio with materials for both of us to consult	7%	6%
Self-monitoring	... prepare a work diary with the activities carried out (dated and with a summary of them) or a laboratory notebook.	11%	28%
Monitorization	... do an oral resume of the research I have been doing, in the individual meetings	23%	53%
	... prepare a regular report of the activities carried out	26%	20%
	... only present him/her the research at the end of it	0%	4%
Critical thinkig development	... have a critical view regarding my research	57%	67%
	... read articles regularly for us to discuss in face-to-face meetings.	23%	31%
Autonomy development	... try to solve the research problems that arise before asking for their help	10%	31%
	... just perform/do what he/she suggests	3%	7%
Communication skills development	... participate as a speaker in national and international congresses or seminars.	36%	43%
	... write an article at the end of each year	36%	22%
	... give an oral presentation at the end of the semester	4%	8%
Tasks outside the Ph.D. project	... supervise a Master's or Bachelor's student	16%	32%
	... teach a discipline	14%	16%
Socialization	... participate in meetings of the research group, to which I belong	27%	56%
Supervision assessment	... give my opinion regarding their orientation / supervision	0%	6%
	... evaluate his/her orientation/supervision	0%	1%
Supervisor performance as a guide project	... usually he/she doesn't ask for anything	24%	23%
	... I rarely meet with my supervisor (co-supervisor)	13%	12%
	... remind him/her of the topic of my thesis whenever we meet	7%	6%

Regarding critical thinking, more than half of students enrolled part-time and full-time reported the supervisor's emphasis on critical thinking development, but few assigned strategies for increasing autonomy research development (10% part-time students and 31% full-time students). The development of communication skills can be analysed considering the attendance to national and international congresses or meetings- less than half are changed to participate as speakers (36% part-time students and 43% full-time students) and writing papers to disseminate their results (36% % part-time students and 22% full-time students). Regarding work in the academy besides the PhD project, 32% of PhD students enrolled full-time are called to supervise Master or Bachelor students and 16 % to give classes (teach a subject). The socialization process is hindered, only 56% of the PhD students enrolled full-time are invited to be a part of the research group meetings, and this only happens to 27% of PhD

students enrolled part-time. The supervision assessment doesn't exist in both attendances, and 23-24% of the PhD students assign no guidance.

The respondents were also asked to assign the characteristics they considered to be part of the profile of the ideal supervisor. The data were analysed considering the profile of a coach and mentor, Table 4. Both give support, but coaching is more structured and goal-oriented, while mentoring is more informal and relationship-focused. The results were analysed considering the type of attendance (full-time and part-time).

Table 4: Percentage of students pursuing part-time (red) and full-time (blue) PhD students from all schools.

Supervisor Type of support	Profile of a good supervisor (A good supervisor...)	Part-time	Full-time
Coach	... should give feedback on the work promptly.	76%	74%
	... should collaborate with the doctoral student in solving the problems that arise in doctoral research	72%	79%
	... should be critical	70%	62%
	... must show that he/she feels responsible for the failure/success of the PhD student	32%	39%
	... should be active (in the research field)	32%	32%
	... must be creative	30%	37%
	... should not intervene in the doctoral student's decision-making during the PhD	3%	5%
Mentor	... should be honest in their opinions about the PhD student's work	76%	74%
	... should be present	68%	69%
	... should be clear in the comments on the work done by the doctoral student.	63%	59%
	... be inspiring	45%	41%
	... should always support the doctoral student	35%	29%
	... should be a patient explainer	28%	45%
	... must be a friend	17%	17%
	... must be a good listener	15%	35%
	... must not interfere with doctoral research	4%	4%
Coach / Mentor	... must be accessible	56%	62%
	... must accompany the doctoral student in doctoral research.	55%	69%
	... must be calm	24%	31%

In the respondent population, the characteristics of a coach are considered more important than those of a mentor. For part-time PhD students, the mean score for coach characteristics is 58.4%, while for mentorship it is 49.2%. For full-time PhD students, the mean score for coach characteristics is 59.7%, and for mentorship, it is 51.62%. Looking at the results, it is possible to say that the supervisor profile is similar in both populations regarding the characteristics of a coach, but regarding mentorship, full-time students give more emphasis on being a "patient explainer" and "good listener". The profile that arises from the results, for each attendance, indicates that a good supervisor is a coach, should give feedback promptly, collaborate with a doctorate to solve problems during the research, be critical, honest, and clear regarding their comments, be accessible, be present, and accompany students during their PhD research (which implicitly implies do the research project monitorization). It is important to note that, prompt and timely feedback is reported in several studies to be very important for completion time as well as frequent meetings and monitoring of PhD research (with explicit research

milestones, which allow students and supervisors to monitor the process) (Latona & Browner, 2001; van de Schoot, Yerkes, Mouw & Sonneveld, 2013; Sidhu Katur, Fook & Yunus, 2014), and that for this population is very relevant.

Coaching helps individuals achieve specific goals or overcome challenges through structured sessions with clear objectives. Coaches offer expertise, advice, feedback, and guidance, focusing on skill improvement and goal achievement. Mentoring, on the other hand, emphasizes personal growth, career development, and overall well-being. Mentoring is a longer-term relationship based on mutual respect and trust. It aims to provide guidance and support in a collaborative process where a more experienced individual, known as the mentor, assists the mentee in mastering tasks or concepts that may initially be beyond their grasp. The mentor provides guidance, feedback, and encouragement to the mentee, as well as temporary support as they work on tasks beyond their current abilities.

Attendance Year for Doctorate in Full-Time:

Considering only doctoral students who attend doctorates full-time it was also possible to see some diversification of tasks considering the year of attendance, Table 4.

The tasks requested by supervisors do not differ much from the first year to the last year of the PhD enrolment. However, there is a slight increase in supervisors who ask students to only write the thesis at the end of the research period (from 8% in the first year to 32% in the 3rd or 4th year). It should be noted that the percentage of supervisors who ask students to try to solve problems that emerge from research before communicating them to the supervisors decreases from 37% in the first year to 27% in the 3rd or 4th year, which may reveal a weak development of the doctoral student's autonomy. It is also possible to see that the supervisors request for PhD students to have a critical view of their research every year (a slight decrease from 72% in the first year, 59% in the second year and 67% in the 3rd or 4th year). Considering that the two main goals of the research project are to develop the doctorate as a researcher (become an independent researcher with inherent research skills), and create (edge)knowledge, without the autonomy and critical thinking development, he will be only a specialised and qualified worker. To have a critical view regarding the research implies a reflection on data, results methods, and knowledge, but also attitudes, ethics and self-regulation (involves the ability to monitor and adjust one's behaviour in response to different situations, to set goals, monitor one's progress, and to adjust one's strategies tend to perform better). Fillery-Travis and Robinson (2018: 847) argue that the process "of critical reflection is central to" the development of the doctorate as a researcher. For these authors, "critical reflection enables learners to: discover the richness of the resources that lie within themselves; expand their perspectives; take responsibility for learning and to move towards independence and sustain motivation (...). Learning is epitomised by their paying careful attention as to what is happening in practice and making changes accordingly to improve performance and outcomes". In this context, supervisors ask doctoral students to critically evaluate their research, viewing the PhD experience as transformative. Research tool acquisition is seen as a social practice, with some authors suggesting that it involves "legitimate peripheral participation," where novices are supported and acknowledged as members of the community while gradually taking on more challenging tasks (Hasrati, 2005; Lee & Roth, 2003).

Table 4: Percentage of students attending the PhD full-time (in the first, second year, third and fourth years of enrolment) who assign the task. They complete the following sentence: "My supervisor asked me to ..."

Domains	My supervisor or co-supervisor asked me (asks me) to...	1 st year of attendance	2 nd year of attendance	3 rd and 4 th year of attendance
Planning	... plan my research	50%	41%	40%
	... write the thesis over the research period	17%	14%	27%
	... whenever we meet, a written record should be made of the topics discussed	13%	7%	15%
Tasks demand PhD students	... write my thesis at the end of my research	8%	3%	32%
	... prepare a portfolio with materials for both of us to consult	6%	0%	8%
Self-monitoring	... prepare a work diary with the activities carried out (dated and with a summary of them) or a laboratory notebook.	25%	31%	30%
Monitorization	... do an oral resume of the research I have been doing, in the individual meetings	50%	52%	56%
	... prepare a regular report of the activities carried out	21%	14%	21%
	... only present him/her the research at the end of it	8%	4%	0%
Critical thinking development	... have a critical view regarding my research	72%	59%	67%
	... read articles regularly for us to discuss in face-to-face meetings.	38%	34%	26%
Autonomy development	... try to solve the research problems that arise before asking for their help	37%	38%	27%
	... just perform/do what he/she suggests	6%	7%	8%
Communication skills development	... participate as a speaker in national and international congresses or seminars.	37%	28%	51%
	... write an article at the end of each year	21%	17%	24%
	... give an oral presentation at the end of the semester	8%	7%	9%
Tasks outside the Ph.D. project	... supervise a Master's or Bachelor's student	25%	24%	39%
	... teach a discipline	15%	7%	18%
Socialization	... participate in meetings of the research group, to which I belong	50%	48%	62%
Supervision assessment	... give my opinion regarding their orientation / supervision	8%	7%	5%
	... evaluate his/her orientation/supervision	0%	0%	2%
Supervisor performance as a guide project	... usually he/she doesn't ask for anything	25%	28%	20%
	... I rarely meet with my supervisor (co-supervisor)	6%	7%	17%
	... remind him/her of the topic of my thesis whenever we meet	2%	7%	7%

Additionally, there is a growing trend of supervisors requiring PhD students to present at conferences (37% in the first year to 51% in the 3rd or 4th year), participate in research group meetings (50% in the first year to 62% in the 3rd or 4th year), and supervise master's or undergraduate students (25% in the first year to 39% in the 3rd or 4th year). This increase in responsibilities may contribute to attrition as PhD students may feel overwhelmed by the additional workload of teaching and supervising tasks alongside their research. But a question emerges: Without any course or training to supervise, their supervisor's example and their own life experience as a PhD student are enough to perform the supervision of others? It should be noted that their supervisor doesn't have also training in supervision (In NOVA Lisbon University is not required to have training or courses regarding supervision to be a supervisor, it is only mandatory to have a PhD).

NOVA School Enrolment: FCT, ENSP, FCM, ITQB:

A supervisor must have the competencies to coach and mentor others. Both coaching and mentoring are crucial in guiding individuals toward their goals and personal growth. While they have distinct characteristics, these two tools can greatly contribute to personal and

professional development, especially for PhD students. Despite their differences, they also complement each other in various ways. An analysis, regarding the supervisors' profile as coaches and mentors, was conducted considering the schools, Table 5.

Table 5: Percentage of Ph.D. students by UNL school who value the characteristics identified in a supervisor.

Supervisor Type of support	Profile of a good supervisor (A good supervisor...)	ENSP	FCM	ITQB	FCT
Coach	... should give feedback on the work promptly.	96%	85%	71%	70%
	... should collaborate with the doctoral student in solving the problems that arise in doctoral research	76%	85%	81%	75%
	... should be critical	72%	66%	52%	65%
	... should be active (in the research field)	40%	37%	14%	37%
	... must show that he/she feels responsible for the failure/success of the PhD student	32%	34%	52%	36%
	... must be creative	24%	44%	19%	33%
	... should not intervene in the doctoral student's decision-making during the PhD	8%	2%	5%	4%
Mentor	... should be honest in their opinions about the PhD student's work	76%	76%	81%	74%
	... should be present	68%	61%	69%	72%
	... should be clear in the comments on the work done by the doctoral student.	68%	49%	33%	65%
	... be inspiring	48%	32%	48%	43%
	... should be a patient explainer	28%	34%	43%	43%
	... must be a good listener	20%	20%	29%	33%
	... should always support the doctoral student	16%	39%	38%	31%
	... must be a friend	16%	20%	14%	17%
Coach / Mentor	... must not interfere with doctoral research	3%	3%	5%	4%
	... must be accessible	64%	56%	81%	59%
	... must accompany the doctoral student in doctoral research.	52%	71%	76%	64%
	... must be calm	16%	34%	29%	30%

Considering that ENSP and FCM are health schools, their supervisor profile is similar. In the ENSP and the FCM, the most valued characteristic of the supervisor is giving feedback on the work, as indicated by 96% of respondents in the ENSP and 85% in the FCM. The second and third most mentioned characteristics in the ENSP and FCM were "collaborating with the doctoral student in solving research problems" (76% in ENSP and 85% in FCM) and "being honest in opinions about doctoral research" (76% in ENSP and FCM). Being critical is also a characteristic highlighted by many doctoral students in both schools (75% of respondents in ENSP and 76% in FCM).

For the majority of ENSP and FCM PhD students, a good supervisor should give feedback on the work promptly, be honest in their opinions about the PhD student's work, collaborate with the doctoral student in solving the problems that arise in doctoral research, must accompany the doctoral student in doctoral research, also be present, should be critical and clear in the comments on the work done by the doctoral student, and be accessible.

Analysing ITQB and FCT, which are schools of science and technology, for ITQB PhD students an ideal supervisor should be accessible, and honest in their opinions about doctoral research, and collaborate on the resolution of doctoral research problems – characteristics are the most appreciated (81% of respondents). However, with a high percentage of assigns, there are also the statements "accompanying the doctoral student in doctoral research" (76%) and "giving feedback promptly" (71%). The doctoral student respondents from FCT highlighted important

characteristics of the doctoral supervisor. These include "collaborating with the doctoral student in problem-solving of doctoral research" (assigned by 75% of the respondents), "being honest in opinions about doctoral research" (assigned by 74% of the respondents), "being present" (assigned by 72% of the respondents), and "providing prompt feedback" (assigned by 70% of the respondents). It should be noted that the characteristic "be clear in the comments to the work of the doctoral student" comes in fifth place in two schools: ENSP (68%) and FCT (65%) *ex équo* with "to be present" (ENSP) and "to be critical" (FCT).

When it comes to coaching, ENSP has an average of 61.7%, FCM has 64.1%, ITQB has 54.9%, and FCT has 58.8%. In terms of mentorship, ENSP has an average of 48.5%, FCM has 47.5%, ITQB has 48.8%, and FCT has 52.7%. The doctoral students at ENSP and FCM emphasize strong competencies in coaching (61,7% and 64,1% respectively), with supervisors acting more as coaches than mentors (48,5%- ENSP and 44,5%-FCM). However, for doctoral students at FCT, supervisors should possess almost the same extent of coaching characteristics (58,8%) and mentorship qualities (52,7%). Different perceptions of the supervisors' rules may be explained by the PhD experiences during the doctoral journey. It is possible to observe that some characteristics are only relevant in some schools (...must be creative; ...must show that he/she feels responsible for the failure/success of the PhD student) but by a significant number of respondents.

CONCLUSION

To become fully integrated into their academic discipline and institution, PhD students must become familiar with the rules, values, practices, and culture of their field. This process begins with orientation activities and continues through interactions with faculty members, peers, and other members of the academic community. PhD students may be expected to participate in seminars, conferences, and other academic events, as well as engage in research collaborations and teaching opportunities. Besides learning the ropes of academic life, PhD students must develop a sense of identity as scholars and researchers. This may involve creating a research agenda, establishing a professional network, and navigating the academic publishing process. PhD students must also learn to navigate the power dynamics inherent in academia, negotiate relationships with faculty mentors, and balance the demands of their research with other responsibilities. The process of integration and socialization is critical for doctoral students as it shapes them to become successful scholars and prepares them for their future careers in academia. Throughout the PhD program, students are immersed in the academic world, learning its norms, values, and practices. Integration involves adopting the culture of academia, which emphasizes critical thinking, research methodologies, and knowledge dissemination. Socialization, on the other hand, teaches students the social roles and norms within the academic community. Doctoral students gain these skills and knowledge through various experiences, such as coursework, research projects, and presenting at conferences. Additionally, building relationships with faculty members, peers, and other academics provides mentorship, networking, and support to help students navigate the demands of the program.

In this research both full-time and part-time doctorate students experience similar practices, but with some differences. Part-time students report that their supervisors ask them to critically evaluate their research (57%), plan their research (49%), write their thesis during the research period (44%), participate in conferences or meetings (36%), write papers at the end of each year (36%), and take part in research group meetings (27%). On the other hand, full-

time students indicate that their supervisors ask them to critically evaluate their research (67%), participate in research group meetings (56%), summarize their research in individual meetings (53%), plan their research (43%), take part in conferences or meetings (43%), give classes (32%) read papers for discussion (31%), and attempt to solve research problems (31%). This indicates that the doctoral research process of full-time students is more closely monitored, and less autonomous, but has a better socialization process. Part-time students are more autonomous but less socialized.

Considering the year of enrolment, in the first-year supervisors ask them to critically evaluate their research (72%), take part in research group meetings (50%), plan their research (50%), resume their research in individual meetings (50%), read papers to discuss (38%), participate in conferences or meetings (37%) and to try to solve their research problems (37%). These PhD students are at the beginning of the research project process and must plan (50%)/or understand (if the project is already approved) their research critically having field knowledge and critical thinking. Their socialization process in the academy and research group is not a priority for half of the supervisors. In the second year, supervisors ask them to have a critical view of their research (59%), resume their research in individual meetings (52%), plan their research (50%), take part in research group meetings (48%), try to solve their research problems (38%) and read papers to discuss (34%). The tasks demanded by supervisors are like the first year but with less degree of suggestions. In the third and fourth year of enrolment, supervisors ask them to have a critical view of their research (67%), take part in research group meetings (62%), resume their research in individual meetings (56%), participate in conferences or meetings (51%), but only 27% ask doctorate to try to solve their research problems. At this point, it is possible to conclude that autonomy is not cultivated by the majority of the supervisors of the PhD students' respondents, as autonomous researchers always try to solve their research problems before asking for help. The doctorate profile that emerges is not of a scholar, but of a specialized science worker, who is integrated into the research group, who has critical thinking to engage in research, and who has communication competencies that allow him to disseminate the knowledge produced in the research. Understanding and actively participating in the culture of higher education institutions is crucial for shaping the experiences and professional development of PhD students. Doctoral students at ENSP and FCM prioritize strong coaching competencies, with their "ideal" supervisors acting more as coaches than mentors. Conversely, at FCT, it is expected that supervisors possess not only coaching characteristics but also mentorship qualities. These differences may be due to the school culture and academic field. The culture of academic communities significantly impacts the experiences of PhD students, and their perception of the "ideal supervision", as it shapes their expectations, the support resources available for their research, and the values upheld within the academic community. By engaging with this culture, PhD students can enhance their success and well-being during their doctoral studies and beyond.

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