

Eurodoc Statement “The doctoral education - a research education”

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Introduction

Eurodoc considers research as a crucial activity for the entire society. Historically, a research career meant a career in academia, but many different sectors employ researchers today. Thus, it has become of growing importance to more explicitly address the role and purpose of research education as this is crucial for defining research and researchers. It is also important to recognise that, though many different career paths can be pursued with a doctoral degree, doctoral education still plays a special role in academia, as doctoral candidates are also the academic teachers and researchers of the future, and thus, doctoral education shapes academia.

Doctoral education is the first stage of an early career researcher’s (ECR’s) career. Pursuing a doctoral degree is both a profession and an education. The aim of doctoral education is to train first stage researchers (R1) into becoming recognised researchers (R2) [1]. Doctoral education differs from other levels of higher education mainly in its emphasis on research as the core of doctoral education [2,3]. Doctoral candidates are trained to become R2 researchers through education and through conducting research under supervision.

The Salzburg principles [4] set out 10 guiding principles for doctoral education, from which the first is that *the core component of doctoral training is the advancement of knowledge through original research*. However, beyond the centrality of research, the Salzburg principles contain little of a definition of what doctoral education is. The key distinguishing feature of doctoral education compared to first and second cycle education is that doctoral candidates are researchers. Consequently, the core essence of doctoral education centers around the imperative task of conducting research. However, more components are needed to build a high quality doctoral education.

The research that a doctoral candidate undertakes in the course of their doctoral education should be an original piece of research that contributes to the knowledge base of a research area, of a particular discipline or at the intersection of two or more disciplines in the case of interdisciplinary research. Doctoral research is an in-depth and original investigation conducted by a doctoral candidate pursuing a doctoral degree. The purpose of any research is to contribute to advancing knowledge in a particular field or at the intersection of fields by generating new insights, ideas, theories, or solutions.

The scope of research conducted by doctoral candidates can vary widely depending on the discipline, research topic, and research methods used. Research is a rigorous and challenging endeavour that requires a high level of intellectual curiosity, creativity, critical thinking, and perseverance. Overall, research conducted by doctoral candidates is a significant contribution to the academic community and is critical to the development and advancement of knowledge in various fields.

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As an R2 level researcher, a doctoral graduate is expected to have the most advanced and specialised skills and techniques, including the capacity for synthesis and evaluation, for solving critical problems in research and innovation, as well as extending and redefining existing knowledge or professional practice. The doctoral graduate is further expected to have demonstrated substantial authority, innovation, autonomy, scholarly and professional integrity, and sustained commitment to developing new ideas or processes at the forefront of work or study contexts, including research [1,2].

Aim and structure of this document

This document outlines Eurodoc’s vision for doctoral education in Europe. It aims to cover all important components of doctoral education, while by necessity has to remain brief and refrain from too many details. The purpose of the document is to provide members of Eurodoc, members of Eurodoc secretariat, and stakeholders an overview of Eurodoc’s opinions on the topic of doctoral education.

The first section of this document concerns the skill set that the doctoral graduate should obtain in the course of their education, distinguishing between expert skills, research integrity skills, and transferable skills. The second section details the external frameworks that should enable and stimulate the development of high quality doctoral education. In separate sub-sections, we outline financial aspects, questions of facilitation of doctoral candidates’ learning and supervision, the issue of the autonomy of doctoral candidates, and lastly the assessment of their skills and competencies obtained. Finally, we touch briefly on some important tenets for quality assurance of doctoral education.

The skill set of a doctoral graduate

The skills of a doctoral graduate are diverse and broad. While the particular skills will vary from individual to individual, there are some commonalities in terms of the skill set of all doctoral graduates. In this section, we try to make this more comprehensive by describing three subsets of this skill set: *expert skills*, *research integrity skills*, and *transferable skills*. All doctoral graduates have what we here call *expert skills*. These skills make the doctoral graduate an expert within their field. Secondly, doctoral candidates have a set of *research integrity skills* linked to the researcher’s profession. Lastly, the skill set of doctoral graduates also includes *transferable skills*. Possibilities for doctoral candidates to acquire these skills must be structurally embedded in all doctoral programmes and distributed in a timely manner across the doctoral education.

There is no clear boundary between what constitutes *expert skills*, *research integrity skills*, or *transferable skills*, and some skills can belong in more than one of these three categories. Nonetheless, Eurodoc chooses to use this division to emphasise that the skill set of a doctoral graduate contains both skills that are closely tied to them being field experts and

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skills that are tied to their general role as researchers and professionals. The relative emphasis and contents of these three categories vary from individual to individual. However, these categories highlight that doctoral graduates develop both deep knowledge of their field of study as well as general skills that are applicable in research across scientific disciplines and are independent of professional activity.

Expert skills

Expert skills are the skill set that make a doctoral graduate an expert within their field of work (scientific discipline, sub-field, or interdisciplinary area). Such skills include the ability to identify research questions, develop hypotheses, design research studies, collect and analyse data, and interpret findings in a field-specific setting. It also includes critical thinking and the ability to identify knowledge gaps and important research questions. Doctoral graduates can evaluate information critically, identify gaps in existing research, and develop innovative solutions to research problems while being aware of the area of their proficiency and conscient of the limits of their knowledge.

Research integrity skills

Research integrity skills are the skill set that reflect that doctoral candidates are trained not only in conducting research but also in conducting research of a certain type that lives up to core academic values such as truth, honesty, transparency, and scientific rigour. The acquisition of research integrity skills should occur through quality instruction and discussion on what constitutes these values, on research ethics, and on the theory of science, peer review, open science, social responsibility, and responsible internationalisation.

Training in research integrity should thus be part of both formal training and a socialisation process, whereby the doctoral candidate becomes part of a research culture. It is important that this socialisation process is guided and made apparent. The formal training in the form of coursework needs to be quality assured.

Finally, it is worth noting that the skill sets that constitute research integrity are under constant change, as are the requirements, roles, and expectations of the research process, output, and societal values. Doctoral graduates must, therefore, be able to participate in discussions on the meaning and application of research integrity skills and core academic values.

Transferable skills

Transferable skills possess inherent versatility, making them applicable across diverse fields and, consequently, endowing them with added intrinsic value. These skills constitute a fundamental pillar of doctoral education.

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Although the specific set of transferable skills obtained by the doctoral candidate will differ by subject matter, methodology, and academic context, we nonetheless list some typical examples below. For a fuller and more complete overview of transferable skills, we refer to previous work by Eurodoc [5], Vitae [6], and ResearchComp [7]. Transferable skills that many doctoral candidates obtain during their education typically include:

- Proficiency in scholarly communication and dissemination of research findings to a variety of audiences. This includes the ability to write clearly and concisely, present research results, and engage in scholarly discourse with peers. It further includes the ability to engage with diverse communities (from highly professionalised to general) through different means (e.g. research articles, oral presentations, popular science, social media, policy briefs) and in an open and FAIR manner [8].
- Proficiency in teaching and supervision of others. This includes, among other things, teaching, supervision, knowledge of pedagogics and didactics of higher education, and the development and examination of courses.
- The ability to collaborate with faculty members, other students, and research participants. This includes the ability to communicate and collaborate with people with different professional and cultural backgrounds. Doctoral candidates learn how to lead and manage people, how to work effectively with others, how to listen actively, how to respect diverse perspectives and how to navigate multilingualism.
- The ability to manage time, through careful planning, organisation and prioritisation of tasks, to meet deadlines throughout lengthy research processes and in a way that furthers the development of project management skills. This proficiency encompasses the flexibility to adapt to evolving circumstances and the capability to revise research plans as needed.
- The ability to move and adapt across academic fields and disciplines (interdisciplinary), societal sectors (intersectoral) and geographic boundaries (international mobility).
- The ability to generate, collect, manage, store, transform, analyse, interpret, document research methodology, and visualise material, information, and data, including the practice of open science [9], be it qualitative or quantitative. This may include the ability to use and develop software, including open-source software.

Transferable skills are a fundamental aspect of doctoral graduates' skill set and represent a key component of doctoral education. They are also central to the value of a doctoral degree qualification, both within and outside of academia. Doctoral training needs to be structured so as to effectively provide the aforementioned transferable skills along with specific ones. Proper structures should be set up at the institutional level to support doctoral candidates to self-assess their competencies at an early stage of their doctoral path, so that they can invest in their transferable skills and prepare for various future career paths.

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The formal framework for doctoral education

Doctoral education is a long-term commitment from doctoral candidates, supervisors, and academic institutions, and should be treated as such. Thus, when we discuss the formal framework for doctoral education, it must always be kept in mind that such commitments, whether financial or time-wise, are long-term.

Financing and educational resources

Financing refers to the funding of individual doctoral candidates. As doctoral education is a long-term commitment, funding needs to be secured for the entire duration of the doctoral education, meaning that the university or academic institution must guarantee that there will be funding for the full length of doctoral education as long as the doctoral candidate progresses as planned. Currently, not all doctoral candidates in Europe are fully funded; some are self-financed, some are on scholarships, and some are employed. As doctoral candidates are professionals and hold academic degrees, the standard needs to be that they are employed. Employment of doctoral candidates is crucial from a diversity and equal opportunity perspective.

Regardless of whether the financing of doctoral candidate positions comes from governmental or competitive funding, the doctoral candidate should be employed by the university or their respective department and not on the specific project of their supervisor. To promote a healthy degree of independence from supervisors and mitigate the risk of potential abuse, it is essential to consistently maintain a clear separation between the roles of manager¹ and supervisor, ensuring that these responsibilities are assigned to distinct individuals.. Each doctoral candidate position should come with a financial package allowing the doctoral candidate some financial independence from the supervisor. This also allows the doctoral candidate to take on responsibility and obtain skills related to project management.

Educational resources refer to any kind of resources, except financing, that the university has to provide for doctoral candidates to be able to complete their education and become R2 researchers and includes supervision, a sustainable and professional work and academic environment, courses, and the defence, but are not limited to this.

It is crucial to ensure transparency and clarity regarding supervisors' and doctoral candidates' responsibilities and expectations right from the commencement of doctoral studies. This can be achieved through a well-defined supervision agreement, which includes clear regulations for how to change supervisors in the severe cases where supervisors fail to live up to their responsibilities, clear and transparent regulations for when the university may

¹ By manager we mean the individual making decisions concerning the employment and working conditions of the doctoral candidate.

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terminate the doctoral candidates' access to financial as well as educational resources, as well as regulations for termination of contracts of doctoral candidates.

Facilitation

Supervision

The practical research done by the doctoral candidate as well as the overarching professional development of the doctoral candidate, should be supervised by one or more senior members of faculty, the supervisors. The doctoral candidate and the supervisors should agree on the standard of supervision in a supervision agreement signed by both the doctoral candidate and the supervisors. The supervisors are the main facilitators of the doctoral candidates' professional development and thus should be required to demonstrate competence in both the particular field as well as in pedagogy. The relationship between doctoral candidates and their supervisors is one of the most important relationships shaping a doctoral education. The qualities that define a good candidate-supervisor relationship are nuanced and defy easy quantification, as the unique circumstances of each academic journey inherently influence them. During doctoral training, the supervisors fill multiple important roles: They act as a gateway to the academic environment in general and the field in particular; they instruct and give feedback pertaining to both small as well as large questions related to the doctoral candidate's work; and they act as a mentor for the doctoral candidate's professional and career development.

It is crucial that not all the roles of the supervisors are fulfilled by the same person. Indeed, it may be advantageous for the doctoral candidate and for ensuring the quality of supervision, as well as for minimising dependency and risks of abuse, if the roles are shared across a supervisory team where different supervisors may play different roles and even exchange responsibilities over time. It is important, however, that the doctoral candidate's relationship with their supervisors is stable and provides continuity throughout the education.

The supervisors must have sufficient time, knowledge, and experience to both provide field-specific insight and to be able to open doors to the local and global academic environments for the doctoral candidate. The supervisors must also have pedagogical competencies that allow them to mentor the doctoral candidate in a way that enhances their development, fosters independence, and provides a constructive and sustainable working environment [10,11]. Institutions should support and incentivise the development of these competencies through pedagogical training as well as continuous discussions in relevant fora.

Academic environment

Supervision cannot stand alone, and doctoral candidates must be embedded into a strong academic environment. Such academic environments comprise all the small and large

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interactions between the doctoral candidate and their academic network. Taken together, the inclusion in and interactions with the academic environment is the second important leg in facilitating doctoral candidates' professional development.

Academic networks and environments take many shapes and forms. To grow as researchers, doctoral candidates not only need supervision, but also need the opportunities to attend colloquiums, summer schools or conferences, and to be included in research discussions with national as well as international collaborators. This also includes developing their understanding of the research process and knowledge production. While supervision and mentoring of doctoral candidates are important, it is equally important that they are given the opportunity to integrate into a peer network and establish connections with fellow doctoral candidates and other members of the academic environment. For their day-to-day work as doctoral candidates, being fully embedded into the research environment is essential.

Finally, it needs to be stressed that academic environments should also include access to environments other than purely research ones. The possibility of collaborations with industry or civil society, teaching, outreach, and/or representational tasks is a strength. It adds an extra dimension to doctoral education, which may serve to better equip doctoral candidates for their future careers and provide them with opportunities to explore different career paths, whether these are within or outside of academia, or both.

Autonomy

The doctoral candidate is a professional and must be provided with a space in which they can act as such in an autonomous yet supervised way. Part of the supervisor's and the academic institution's duty is to entrust the doctoral candidate with professional research responsibilities increasingly.

Doctoral candidates' autonomy pertains to their own research, e.g., subject matter, research question, approach and methods, and operational project management throughout the research process; their studies, e.g., selection and timing of doctoral courses; as well as in building collaborations with other researchers. It is important that this autonomy is gradually provided in accordance with the doctoral candidates' increasing competencies and skills, which may be either formally or informally gauged. As part of their independent pursuit of knowledge, the doctoral candidate as a professional needs to be recognised as the main steward of their professional development.

Finally, it is crucial to stress that doctoral training is both an education and an employment. As participants in an education, doctoral candidates should be represented where decisions about their education are discussed and be included in the decision making process. As employees, doctoral candidates should have the same representational rights as other employees at the universities, such as the right to representation by a trade union. To

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include doctoral candidates in the representational work is of mutual benefit for the doctoral candidates as well as the university as the employer and educational providers. Through these experiences, the doctoral candidates are trained in what constitutes the institutional autonomy of the universities.

Assessment of the doctoral education

Assessment and documentation of progression

The progress of the doctoral candidate should be evaluated and documented in different ways, either continually or incrementally throughout the doctoral education. Systems for evaluation and documentation must take into account that the doctoral education is not linear and does not necessarily follow a set and standardisable progression. Check-points, such as halftime seminars or non-terminal licentiate degrees, are important both for the doctoral candidate and for the supervisor to ensure documentation, feedback, and points for re-evaluation, but should be spaced in ways flexible enough to allow for non-standard trajectories in the doctoral education.

Assessment of transferable skills

Which transferable skills a doctoral candidate develops during their doctoral education programme varies based on factors such as the structure of the doctoral program, the personal working and training experiences, and the research field. Therefore, a prescriptive single and exhaustive description of the skill set is not constructive. Rather, it is advisable that each doctoral candidate is provided with an individualised portfolio that offers a comprehensive description of the specific transferable skills and competencies they acquired. This accounts for both the type of developed skills (not every listed one is necessarily developed by every doctoral graduate) and the different level of proficiency achieved.

The doctoral defence

The final step towards obtaining the doctoral degree is, in most cases, the defence of the doctoral thesis. The purpose of the thesis is to show that through their own research, the doctoral candidate has contributed to the development of knowledge within their research field or at the intersection of research fields.

How doctoral defences are carried out varies. However, since the doctoral defence is the final examination, the procedures must be transparent, unbiased, and fair. Accordingly, for example, the supervisor should not be included in the evaluation committee.

Awarding the doctoral degree

While the final assessment of the doctoral education is the evaluation of the doctoral thesis and the defence of it, the doctoral degree is not awarded solely on the basis of these two assessments. The awarding of the doctoral degree also includes an evaluation that the doctoral candidate meets their other requirements of their doctoral education.

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Quality assurance of doctoral education

Doctoral education should be systematically and regularly quality assured. This means that the goals of doctoral education and the opportunity of the doctoral candidate to achieve these goals need to be regularly and systematically assured, independently of the output of the doctoral candidates. Where not already in place, systematic and independent quality assurance mechanisms for third cycle education must be implemented.

Evaluation of the quality of doctoral education must take a holistic approach and needs to include, among other things, supervision, doctoral courses and course offers, the independence of doctoral candidates, equal opportunities as well as other constituents listed in this document. Quality assurance mechanisms must be independent of political governance and based on qualitative methods and peer review, with quantitative indicators responsibly adopted where appropriate. A clear framework for quality assurance must be established, in the development of which the voice of doctoral candidates needs to be given a prominent role. Doctoral candidates should be represented when and where doctoral education is quality assured on equal terms with other members of, for example, quality assurance panels or similar organs.

Conclusion and outlook

Doctoral education is a research education and doctoral candidates are researchers. However, being a researcher and conducting research is multifaceted. With this statement, Eurodoc hopes to expand the understanding of what doctoral education entails to a more holistic point of view. This includes expanding the understanding of the skills and competencies doctoral graduates acquire and ensuring that the development of expert, transferable and research integrity skills receive the necessary support and are assessed and documented appropriately. The development of such skills among doctoral candidates requires a sufficient framework and that doctoral candidates have the necessary financial as well as other resources.

There is no one size fits all when it comes to doctoral education, solutions and implementations must be dependent on societal context, academic field, institution and individual preferences but also adhere to international standards. As participants in education, doctoral candidates should be represented where decisions about doctoral education are discussed and be included in the decision-making process. At the same time, doctoral candidates contribute significantly to the research output of their academic institutions. Therefore, they must be regarded and treated as professionals, with all corresponding rights—from employment rights to academic freedom—equally extended to them. The quality of doctoral education is ensured when all of the above is provided. Quality

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assurance of doctoral education, in other words, is complex and must take all of these aspects as well as others into account and thus fundamentally necessitates a holistic approach.

We look forward to a sustained discussion of what a high quality doctoral education is and how it can be ensured that all doctoral candidates have access to it.

References

- [1] [EURAXESS research profile descriptor](#)
- [2] [European Qualification Framework](#)
- [3] [EUA Doctoral Programmes in Europe's Universities](#)
- [4] [Salzburg principles](#)
- [5] [Eurodoc Skills report 2018](#)
- [6] [VITAE Researcher Development Framework](#)
- [7] [ResearchComp: The European Competence Framework for Researchers](#)
- [8] [FAIR Principles](#)
- [9] [Eurodoc statement on Open Science 2023](#)
- [10] [The Human Resources Strategy for Researchers](#)
- [11] [Eurodoc statement on Academic Freedom](#)

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Eurodoc, the European Council of Doctoral Candidates and Junior Researchers, is a grassroots federation of 25 national associations of early career researchers (ECRs) from 23 countries across Europe. Eurodoc was established in 2002 and is based in Brussels. As a representative of doctoral candidates and junior researchers at the European level, Eurodoc engages with all major stakeholders in research, higher education, and innovation in Europe.

