

# Doctoral education in Europe and North America: a comparative analysis

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## Changing policy contexts in Europe and North America

In recent years doctoral education and training has become part of the focus and scrutiny of policy formation. Currently, a number of reform initiatives are being undertaken to improve the teaching of doctoral students.

In Europe, both the Bologna Declaration of 1999 [1] (the aim of which was to create a European Higher Education Area) and the Lisbon Strategy of 2000 (formulated to create a European Research and Innovation Area) have certainly had an impact on the perspective and conceptualization of doctoral education and training. Although doctoral training has been integrated as the third phase of higher education in the framework of the Bologna Declaration (an intergovernmental initiative so far signed by 45 European countries), the presidential conclusions of the EU (European Union) Lisbon Summit stated that more and better trained researchers were needed in order to make Europe the most competitive and dynamic knowledge-based economy in the world. Doctoral education and training is seen as the link between the two goals, which are to create a European Higher Education Area and a European Research and Innovation Area in order to make European higher education more attractive and competitive in a globalizing world.

It is not only Europe that is thinking about strategies to become more competitive. In North America similar changes to policy contexts can be identified. National and international forces and developments have triggered extensive criticism and a major re-thinking of doctoral education over the last 15 years [2]. In his analysis of doctoral education in Canada, Garth Williams [3] stated that “globalization has altered both the context and substance of university education, advanced research and doctoral training”, with ‘globalization’ being characterized by a number of factors such as; the new economy, the growth of multinational corporations, greater international movement, a revolution in communication technology, increased production and more intense economic competition worldwide (see p. 15 in [3]).

It has become clear, through these roughly sketched developments, that doctoral education and training is no longer exclusively regarded as the disinterested pursuit of knowledge, but that the generation of new knowledge has become both an important strategic resource and a factor in a countrys economy. Thus policy makers have begun to scrutinize doctoral education and training, and as a result universities have been requested to develop institutional strategies to improve it, rather than leaving it in the hands of individual professors or departments.

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Another factor that has contributed to the changing policy context, which has been observed in Europe as well as North America, is that over the last 10–15 years there has been a considerable increase in the number of doctoral students — or ‘early career researchers’ as they prefer to be called in Europe — and subsequently in the number of doctoral degrees awarded. This therefore means that an increasing number of doctoral degree holders will not remain in academia but seek employment in labour markets outside universities and research institutes. For these jobs, a research education within disciplinary boundaries and skills geared towards teaching and research are deemed to be insufficient.

## Problems in doctoral education

In the last couple of years a number of major comparative studies have been carried out, which looked at the existing criticisms of doctoral education and training by analysing their problems and trying to suggest recommendations for improvement. In this chapter three of them will be predominantly referred to:

1. The UNESCO (United Nations Educational, Scientific and Cultural Organization)–CEPES [Centre Européen pour l’Enseignement Supérieur European (Centre for Higher Education)] project on *Doctoral Studies and Qualifications in Europe and the United States* [4,5] that analysed the status and ongoing reforms of doctoral education and training in 12 European countries and the USA by commissioning national case studies and a synthesis report.
2. The CIRGE (Centre for Innovation and Research in Graduate Education) initiative was presented at a conference organized by the University of Washington on *Forces and Forms of Change in Doctoral Education Internationally*, where experts and practitioners from 16 countries around the world were invited to discuss, on the basis of a number of reports from different countries, recent developments in the changes to doctoral education. The goal of this conference was to form a network that would continue the initiative through the analysis of ongoing changes in graduate education, and allow the exchange of examples of good practice [2,3,6,7].
3. EUA (European University Association) project on *Doctoral Programmes for the European Knowledge Society* that consisted of a network of six universities, where each analysed a particular aspect of doctoral education and training (e.g. structure and organization, funding and quality). The individual network reports were then integrated into an overall report [8], from which recommendations for changes in doctoral education and training were made.

In addition, a number of other studies regarding doctoral education have been carried out, predominantly in Europe, on national levels and also within frameworks of comparative approaches. A number of networks have been formed in Europe to represent the interests of doctoral students with regards to European policy making and reforms. In the USA graduate students (in the USA doctoral education is considered part of graduate education, which also includes studies at master's level) have started to unionize, and the Council of Graduate Schools is heavily involved in facilitating changes in graduate education.

The problems with doctoral education that have been identified [5] are discussed in the sections that follow.

### **Institutional structures and the shape of doctoral education**

Although there is a clear trend in Europe to give doctoral education more structure, e.g. in the form of graduate schools or doctoral programmes, the traditional ‘master–apprentice’ model is still widespread. The problems with the master–apprentice model are well known: there is a high degree of personal dependence on the supervisor, a frequent lack of quality in supervision, high drop-out rates and often there is an overly long period before the degree is completed.

### **Admission to doctoral education**

In Europe, admission to doctoral education ranges from the highly regulated and competitive to the rather informal and unregulated. Eligibility, selection criteria and admission procedures are frequently as nontransparent and varied as the requirements for admission in terms of the candidates previous studies and formal qualifications.

### **Status of doctoral students and requirements**

The status, that is, how doctoral students are regarded by their host institution can also vary considerably. In most European countries and also in North America, it is that of a student, where tuition fees have to be paid, thus providing an income for the institution. However, in some European countries (e.g. in Scandinavia and The Netherlands), the doctoral student is regarded as an employee (as a junior staff member) of the university with duties, rights and a regular salary. Increasingly, contractual relationships between the doctoral student and the institution or department are established to provide more transparency in terms of the requirements and obligations of both sides. EURODOCS (European Doctoral Student Network) prefers the designation of doctoral students as ‘early career researchers’, and is lobbying for the recognition of this phase of qualification as the beginning of a professional career rather than as a continuation of the individual’s studies.

### **Funding**

Funding is another issue of great diversity in Europe as well as in North America. We find tuition fees at the one end of the continuum and salaries at the other. In between are scholarships and state grants, part-time jobs and paid teaching positions. As a rule, the insecure financial situation of doctoral students, in particular in European countries, has contributed to high drop-out rates and an increase in the time needed to successfully complete this period of qualification. In the USA the phenomenon of drop-out and lengthy periods tends to occur in the period between finishing the coursework and before the submission of a completed thesis.

### **Increase in the number of doctoral students**

In most European countries the number of doctoral students (and eventually the number of doctoral degrees awarded) has increased over the last 10 years. With only a few exceptions — notably Spain with a 30% increase in doctoral students and Sweden where the number of doctoral degrees awarded almost doubled in the 1990s — the average proportion of graduates undertaking doctoral training

is between five and 10%. OECD (Organisation for Economic Co-operation and Development) statistics [9] show that, with approximately 23 000 to 25 000 doctoral degrees awarded annually, Germany produces one of the highest proportions of doctoral degree holders in relation to the number of university graduates worldwide. It is notable that there is an overall increase in the number of women entering doctoral studies as well as an increase in part-time doctoral studies. Furthermore an active campaign to attract the best talent from abroad has started in some countries. North America has been known to do this for quite some time, and it is increasingly occurring in Europe, notably in the Netherlands and the UK. There are further visible problems in Europe due to the increase in doctoral student numbers, such as an unequal balance between subjects, i.e. more doctorates are produced in the humanities and social sciences, and too few doctorates are produced in engineering, technology and natural sciences. In addition, in some of the European countries (e.g. Poland and Italy) the labour market for doctoral degree holders outside academia is virtually non-existent.

### **Duration of doctoral studies**

As mentioned before, a long time-to-degree and high drop-out rates are an issue for concern in many countries, including the USA (where students need between six and nine years to complete a doctorate depending on the subject and also on the institution). In the humanities it takes the longest, while doctoral students in the life sciences complete this phase of qualification most rapidly [10]. In Canada, the average time for completion of a doctorate is more than five years in all subjects (an average of 5 years and 10 months across all disciplines), with students in the humanities and social sciences requiring more than 6 years [3]. In Europe, the time-to-degree varies considerably depending on the subject and on how the doctoral education and training takes place, that is, whether it is within the framework of a programme or school or if it follows the traditional master-apprentice model. In general, it can be said that a doctoral degree takes longest in the humanities and shortest in medicine, engineering and some of the natural sciences. The reforms triggered by the Bologna Declaration envisage a duration of 3–4 years to achieve a doctoral degree in the future. However, some European countries still have two phases of doctoral training often increasing the average age of doctoral students at the time they are awarded their degree. Compared with North America, statistics on drop-out rates are not as widely known in Europe.

### **Supervision and quality control**

The long duration of doctoral studies is often related to a lack of supervision and insufficient quality assurance mechanisms. Only a few European countries have tried to regulate this area, notably the UK, The Netherlands and the Nordic countries. Within the framework set out by the Bologna Declaration and the Lisbon Strategy, considerable attention is currently being given to the issues of supervision and quality control of doctoral education in Europe. The Central and Eastern European countries tend to rely more on state regulations and governmental bodies, while in most other countries, including North America, this is a task undertaken by the institutions themselves. However, in the USA, institutions have to follow the regulations of the (national) Council of Graduate Education, whereas in Canada, apart from the Canadian Association of Graduate Studies,

the provinces also influence policies of graduate and postgraduate education and training. Overall, there is great variation between countries and no optimal model has yet been proposed. Notably in North America attention to the quality of supervision and also to quality control of doctoral programmes has been an issue for quite some time.

### **Mobility and international exchange**

Horizontal mobility, that is, a limited period of study and research abroad, as well as the exchange of doctoral students between countries is lower than expected. Three issues tend to prevent this type of mobility and exchange. In countries with tuition fees, doctoral students constitute an income for the institution therefore the institution will try to keep the doctoral students there. In many countries, it is feared that brain drain will set in, that is, once doctoral students have gone abroad, possibly to an institution with better infrastructure, or to a country with higher income and better living conditions, they will not return. Economically this constitutes a low return on an investment. Finally, in some subjects there is fear that an exchange of doctoral students will involve an exchange of innovation, research results and knowledge that might be turned into a profit through patents and licenses by the host institution, thus creating a competitive disadvantage. The other side of this coin, however, is vertical mobility, i.e. doctoral students leaving their home country to get a doctoral degree in another country. We find an increasing degree of competition for best talent among European countries preferably for the whole duration of their training or their specific programme, and less so for temporary periods abroad. In Europe, a stronger emphasis is still placed on temporary mobility and exchange within the framework of institutional collaboration and networks, joint doctoral degrees and inter-sectoral mobility, and a debate on the conceptualization of a European doctorate. The trend in North America differs from Europe, as North American institutions try to attract doctoral students for the whole duration of their qualification period, and even provide attractive conditions to keep international doctoral degree holders in the country. In Canada, one-third of all doctoral students are from abroad and 60% of them intend to remain in the country after receiving their degree [3]. In 2003, the proportion of international students achieving their PhD in the USA among all PhD recipients was 26% [2]. In Europe, and in particular the UK, Spain and the Netherlands there are high levels of international doctoral students. In other European countries their proportion remains under 10%.

### **Award of titles and degrees**

There is high variation as regards the requirements for the award of the doctorate. Writing a thesis and defending it is the rule, but there are additional requirements in a number of European countries and North America. Validating the performance also varies considerably, many European countries involve external examiners or have created some other mechanisms to guarantee independent judgment. Germany, Austria and several of central and eastern European countries still have the highly subjective and personalized old system very much in place. The trend is towards a more objective and de-personalised assessment of performance through shared supervision and inclusion of external examiners.

### **The new trend of professional doctorates**

It is clear that with the rise in number of doctoral degree holders that not all of them will be able to follow a career in academia. Although there are still some countries in Europe in which industry and commerce are not interested in hiring such a highly qualified workforce, the labour market for doctoral degree holders outside academia is mostly improving. However, there is still widespread criticism that they don't have appropriate skills and competences. In two countries, namely the UK and the Netherlands, a professional doctorate has been introduced. In Austria there is an ongoing pilot project, which has the aim of developing a professional doctoral degree. Such programmes aim to provide the necessary skills and competences to increase employment opportunities outside academia. To gain a professional doctorate, the requirement to produce original research is somewhat lower, instead coursework is designed to emphasize generic skills and interdisciplinary approaches to problem solving. For the thesis, joint projects are carried out in conjunction with a company or potential employer. However, it is still currently unclear whether this development will lead to a training status or to an employment status of the doctoral students.

### **Transition into an academic career**

Basically most doctoral degrees continue to be considered as research degrees, which qualify the individual for a career in universities or research institutes. In Italy, the number of doctoral students accepted is limited to the number of available positions in this field. In other countries there is talk of 'overproduction' of doctoral degree holders resulting in a wide variety of post-doctoral fellowships and in-between positions characterized as 'holding positions' where post docs stay in a waiting loop until proper employment is found. This does not only prolong the time until the beginning of a proper career, it also adds an additional layer of uncertainty to the life-planning of young academics. Seen from a perspective of return on investment and productivity this situation is not very viable.

It is now possible to see where there are similarities and differences between aspects of the reform of doctoral education and training in Europe and North America. Both regions share concerns about providing doctoral students with a wider range of skills that will increase employment opportunities outside academia, the length of the doctoral education until completion of the degree and the quality of supervision the student receives. However they differ with regard to the structure of doctoral programmes (including coursework), which is in place in North America but not yet everywhere in Europe, and securing funding on a programme level as well as for the individual student. Here the situation seems to be more unstable and insecure in Europe compared with North America.

Overall, one issue stands out as being of major importance, which also attracts high levels of criticism both in Europe and in North America, namely that doctoral education and training should meet the needs of a wider employment market than academia [8]. This aspect is listed as the first of the 'ten basic principles' identified in the EUA report on which further work is required. A summary of the major criticisms of the doctoral education system in the USA, provided by Nerad and Heggelund [2] and Nerad [11], emphasizes this when stating that doctoral students are believed to be:

- educated and trained too narrowly;
- lacking key professional skills, such as the ability to collaborate effectively and work in teams, and lacking organizational and managerial skills;
- ill-prepared to teach;
- taking too long to complete their doctoral studies and in some fields many are not completing their degrees at all;
- ill-informed about employment outside academia, and;
- having too long a transition period from PhD completion to stable employment.

In Canada, the majority of doctoral degree holders (56%) start employment outside academia, although more than half of them remain in what is called the educational services industry. Doctoral education and training in Canada is clearly linked to strategic national ambitions for scientific and technological competitiveness. More fellowships and other sources of public and private funding for doctoral education and training are available in the sciences and engineering subjects compared with other fields. This leads to the fact that 43% of all doctoral students are enrolled in the sciences and in engineering compared with only 21% of all bachelor and master students in these subjects. In particular, a re-structuring of doctoral education and training to include more interdisciplinary work has taken place in recent years [3]. A higher level of interdisciplinarity in doctoral education is also called for in the USA and Europe, because it is hoped that in such settings transferable skills will be developed more easily.

## Forces and forms of change

Concerning the forces and forms of change at work in doctoral education we find notable differences between Europe, the USA and Canada due to national traditions and general policy developments.

In Europe, we can observe a shift in policy making for doctoral training and advanced research from the national to the supra-national level. The Bologna Declaration as well as the Lisbon Strategy have reinforced this trend. More often than not, innovative models and new ideas are generated in European working groups or associations. With regard to doctoral education and training, the EUA has received a mandate to continue its work. At the same time a European working group is developing a qualification framework for doctoral education and training, and a European network of quality agencies is setting up a number of standards to ensure the quality of the doctoral degree. The European reform agenda is then moving to focus on the national level and has both adopted and adapted to fit specific national ambitions and strategic goals. For example, in Germany, the German Academic Exchange Service received government funding in order to support a number of international doctoral programmes. In addition, there is a joint initiative between the Federal Ministry for Education and Research and the German states to create a number of elite, research intensive universities in Germany, in which innovative concepts for graduate schools will receive considerably more funding. A recent, as yet unpublished study by Martens and Wolf [12] on the internationalization of education policy pointed out that national governments in Europe frequently

use the EU level in order to outmanoeuvre domestic opponents and institutional barriers to create a pressure for change. However, they also observed that with such a move, while gaining a higher degree of autonomy in terms of competences, national governments at the same time lose autonomy in terms of the function they have in the field of higher education politics.

Due to the rather decentralized structure of higher education and higher education-policy making in the USA, national initiatives for change in doctoral education are spread among a number of bodies which lie predominantly with private foundations. All of these have set up support programmes and initiatives targeting either the national or a local level as well as different constituencies. A few of these private foundations are, the National Science Foundation, the Council of Graduate Schools, the Carnegie Foundation for the Advancement of Teaching, the Pew Foundation Charitable Trust, the Woodrow Wilson National Fellowship Foundation, CIRGE and the Ford Foundation [2]. Apart from incentives, however, many of these initiatives basically serve as a platform for dialogue and exchange of good practices and mostly “appeal to a moral imperative of the necessity to change” (see p. 25 in [2]).

In Canada, due to the federal structure where the provinces have a high level of autonomy in educational matters, forces for and forms of change have been “driven by changing intellectual currents and national interests negotiated through universities, provinces and the federal government” (see p. 38 in [3]). This is characterized as a ‘tacit social contract’ between the universities and the two levels of government which evolved in the 1950s. Although no unified doctoral training system has been developed, the distribution of responsibilities among the three main actors facilitates the negotiation of both contextual and substantial changes today in much the same way as before. The federal government provides funding for those fields which are deemed to be of strategic national interest and the national economy, while the provincial governments try to control costs and increase quality, flexibility and research planning. The universities increasingly look for financial support from students and the private sector [3].

Despite these differences between Europe and North America in terms of the forces and forms of change in doctoral education, there is one factor of change which is clearly similar, namely the shift in responsibility from the individual and/or departmental level to the institutional level to reform doctoral education. Well-regarded doctoral education and programmes increasingly contribute to the overall reputation and profile of an institution, which enables them to attract the best talent and funding, and thus begin to play a more important and extended role than just serving as an extension of the knowledge base in their chosen discipline.

### **Summary and conclusions: factors triggering and directing change**

It could be said that doctoral education and training is undergoing a paradigmatic change insofar as it is no longer regarded exclusively as an academic affair, that is, only being part of the tasks and responsibilities of the individual professor or, at the most, of the department or faculty. It has moved into the focus of institutional and national policies [13], however there are more shifts involved in the ongoing

changes. The European initiatives to create a European Higher Education and Research Area are increasingly influencing and even shaping the national agendas with regard to doctoral education and research training.

There is a basic agreement in Europe that high quality research training as well as a greater supply of qualified researchers are important elements in order to realise the vision of a Europe of knowledge. To achieve these goals doctoral education and research training is supposed to be given more structure to improve its quality and relevance. In identifying the goals of the reform and analysing the instruments and models used to implement it, we can observe two underlying trends.

The first trend is that doctoral education and research training is no longer regarded as driven by basic curiosity and as the disinterested pursuit of knowledge. Instead the generation of new knowledge has become an important strategic resource and an economic factor. It thus becomes a commodity and its shape acquires a more utilitarian approach. Policy makers have begun to be interested in the state of research training and as a result universities have been requested to develop institutional strategies for it. In addition, it is deemed so important a resource that it is no longer left in the hands of professors and departments but has become an object of policy making and has moved to the institutional, national and even supra-national levels.

The second trend is that in most highly developed countries across the globe there has been a considerable increase in the number of doctoral students and doctoral degrees awarded over the last 10–15 years. A further considerable increase is expected as a result of the implementation of the Bologna Declaration and the Lisbon Strategy. This means that an increasing number of doctoral degree holders will not remain in academia but seek employment on the labour market outside universities and research institutes or academies of science. Actually, this development is expected to trigger economic growth and innovation. However, for these jobs a research training within disciplinary boundaries and the acquisition of skills geared towards teaching and research in higher education institutions are deemed to be insufficient. Thus, reforms of doctoral education and research training are a must, even if we don't agree to the trend towards commodification of knowledge production.

The impact of globalization with its increased emphasis on competition on the one hand and strategic alliances on the other has been identified as one of the main factors triggering change in doctoral education and research training. Globalization is linked to the faster dissemination of information and knowledge through new information and communication technologies. This has not only led to the fact that information and new knowledge become outdated much faster than before but also an increased emphasis on the production of new knowledge. In the emerging knowledge societies or knowledge-based economies, knowledge production has become a commodified and strategic national resource. These developments have started to have an impact on the ways in which knowledge is generated in universities and on how education and training for the future knowledge producers is organized. It is no longer almost exclusively geared towards self-recruitment of the teaching and research staff within academia but towards a much broader range of careers in society and the economy.

Emerging models for research organization and research training for the knowledge society differ from traditional models in several respects. Paavo Uronen has summarized them as follows [14]:

- from national to international;
- from basic, curiosity-driven research to results-oriented research (i.e. relevance, impact);
- from individual research to team research;
- from narrow, disciplinary-oriented research to multidisciplinary research;
- from small laboratories to larger research institutes, programmes and centres of excellence (i.e. critical mass);
- from fragments to big science;
- from public or university funded to multiple funding sources;
- from unbound research to research within programmes and projects;
- from purely academic to the professional;
- from national security to competitiveness and job creation, and;
- from utilization of resources to sustainable development.

Emerging models for research and research training for the knowledge society have begun to differ from traditional models in several respects.

- There is a trend to approach doctoral education and training in a more systematic way by providing structured programmes with increased transparency, including codes of ethics, and regulations or even contracts to define the rights and responsibilities of students, supervisors and institutions. Critical mass and concentration are issues here as well.
- There is a stronger trend towards internationalization through mobility and in the substance of what is taught, studied and learnt.
- There is an increase in governmental and institutional steering of research training emphasizing institutional, societal and economic relevance as well as competitive advantages.
- There is a growing trend towards interdisciplinary approaches in doctoral programmes and schools to provide key skills and qualifications for careers in mixed research settings outside academia.

In contrast to North America, the European model of doctoral education and training is still very much shaped by the traditional master–apprentice model, and for a while longer this will certainly continue to be the dominant case. However, the idea of doctoral programmes is spreading and will become increasingly important. Approaching doctoral education in a more systematic way and providing it with more structure while at the same time working towards more transparency in admission, selection and quality assessment will probably leave enough room for national traditions and ambitions to remain.

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