



Studies on Higher Education

Doctoral Studies and Qualifications in Europe and the United States: Status and Prospects

Edited by

Jan Sadlak

**Bucharest
2004**

Studies on Higher Education

Editor of the Series:

Daniel Lincoln

Assistants to the Editor:

Maria-Ana Dumitrescu
(Editing Clerk)

Viorica Popa
(Secretary)

ISBN 92-9069-179-4
© UNESCO 2004

Table of Contents

Preface – and Introduction to Theme	7
<i>JAN SADLAK</i>	
I. Austria.....	13
<i>HANS PECHAR and JAN THOMAS</i>	
1. General Features of Austrian Higher Education	13
2. Doctoral Studies.....	14
3. Access to Doctoral Studies.....	16
4. Recognition of Foreign Degrees	20
5. Problems and Challenges.....	22
6. Recent Developments	26
II. France.....	37
<i>JEAN LEMERLE</i>	
1. Introduction	37
2. Quantitative Trends	38
3. Award of Doctoral Degrees and Qualifications.....	40
4. Admission to Doctoral Studies.....	43
5. Recognition of Foreign Qualifications.....	49
6. Note on the Data Presented in the Text and in the Tables.....	50
References.....	50
III. Germany.....	51
<i>KLAUS HÜFNER</i>	
1. Introduction	51
2. A Statistical Overview.....	52
3. Problems in Doctoral Studies.....	56
4. Recent Developments	57

IV.	Italy.....	63
	<i>ROBERTO MOSCATI</i>	
	1. The Recent Evolution of Italian Higher Education	63
	2. The National Doctoral Programme	65
	3. Programme Development	68
	4. Limits and Difficult-to-Resolve Contradictions.....	73
	5. Concluding Remarks.....	75
V.	The Netherlands.....	77
	<i>EGBERT DE WEERT</i>	
	1. Towards a More Structured Doctoral Education System.....	77
	2. Emergence of Research Schools.....	80
	3. Quantitative Trends	81
	4. Organization of Doctoral Studies.....	84
	5. Trends and Challenges.....	91
	6. Conclusion	95
VI.	Norway.....	99
	<i>INGVILD BROCH and BERIT HYLLSETH</i>	
	1. System of Doctoral Degrees.....	99
	2. Quantitative Trends	104
	3. Doctoral Degrees Awarded in Norway and in the Other Nordic Countries.....	108
	4. Doctoral Degrees and Qualifications.....	109
VII.	Poland.....	119
	<i>MAREK KWIEK</i>	
	1. The Doctorate Environment.....	119
	2. Employment of Doctorate Holders.....	123
	3. The Doctorate and the Habilitation	125
	4. Doctoral Students	129
	5. The Future of Doctoral Studies.....	132

VIII. Romania.....	135
<i>CONSTANTIN BRATIANU</i>	
1. Structure of the Higher Education System	135
2. Doctoral Study Programmes.....	138
3. Quantitative Data.....	144
4. Conclusions.....	148
IX. The Russian Federation.....	153
<i>EVGENY KNYAZEV</i>	
1. Introduction	153
2. Structure	154
3. Quantitative Developments.....	159
4. Doctoral Degrees and Qualifications – Organization of Studies, Examinations, and Procedures.....	167
X. Spain.....	189
<i>CARMEN RUIZ-RIVAS</i>	
1. General Information	189
2. Organization of Doctoral Studies, Examinations, and Procedures.....	191
XI. Sweden	201
<i>HELENA MÄHLER</i>	
1. The System of Higher Education.....	201
2. Institutions entitled to Organize Postgraduate Studies and to Award the Corresponding Degrees	207
3. Quality Audit and Evaluation of Postgraduate Education.....	209
4. Regulations Regarding Doctoral Studies and Programmes.....	210
5. Financial Support and Employment Status of Postgraduate Students.....	213
6. Examination Requirements and Procedures.....	216
7. Evaluation of Foreign Qualifications.....	218
8. Difficulties and Challenges Encountered by Students, Supervisors, and Institutions.....	219
9. Quantitative Trends	221
10. The Labour Market for Degree Holders	226
11. Concluding Remarks.....	227

XII. The United Kingdom.....	231
<i>JOHN TAYLOR</i>	
1. Introduction	231
2. Key Trends in Doctoral Education	231
3. Subject of Study	234
4. The Further Development of Doctoral Studies.....	236
5. Quality Matters	247
6. Conclusion	251
7. Appendices.....	251
XIII. The United States: Present Realities and Future Trends.....	259
<i>PHILIP G. ALTBACH</i>	
1. Introduction	259
2. The Size and Shape of the System	260
3. Patterns of Doctoral Studies.....	262
4. Accreditation and Quality Control.....	264
5. The Funding of Doctoral Studies.....	266
6. Doctoral Studies as an International Enterprise	267
7. Challenges to Doctoral Studies	269
8. Quantitative Data.....	273
9. Conclusion	275
XIV. Developing Doctoral Degrees and Qualifications in Europe: Good Practice and Issues of Concern – A Comparative Analysis.....	279
<i>BARBARA M. KEHM</i>	
1. Introduction	279
2. Requirements of the European Higher Education Area (EHEA) and the European Research and Innovation Area (ERIA).....	279
3. Issues.....	283
4. Concerns, Problems, Reforms	294
5. Conclusions: Doctoral Education within the European Higher Education and Research Area.....	296
The Contributors.....	299

Preface – and Introduction to Theme

JAN SADLAK

The current European scene of policy debate on higher education and science is delineated by two pan-European initiatives – the European Higher Education Area (EHEA) to come into being by the year 2010, and the European Research Area (ERA), the development of an optimal research environment to make Europe the leading knowledge-based economy.

To a great extent the two “Areas” are viewed as convergent in certain respects, and the issues related to the education, training, and development of “human resources”- Doctoral studies and qualifications included - are rightly viewed as bridges between the European Higher Education Area and the European Research Area. Increasingly, these issues are going to be part of the debate on the future development of higher education and research in Europe. Held in September 2003 in Berlin, the conference of Ministers responsible for Higher Education confirmed the necessity “... to include the Doctoral level as the third cycle in the Bologna Process”, in the wake of the Bachelor and Masters’ cycles.

A number of voices have been drawing attention to the need for a greater number of researchers in Europe - a massive shortage of manpower varying reportedly between 600,000 and 800,000 scientists across the European Union. One of the most eloquent of these voices is Philippe Busquin, European Commissioner in charge of research, who has repeatedly argued that “Europe more than ever needs research”; it is a matter of “economic survival” due to the fact that “half of [the economic] growth is being obtained through innovations”¹. Various “innovation scoreboards” convincingly illustrate a European weakness in the global knowledge-driven technological competition, and not only as a result of under-funding.

It is abundantly clear that research carried out in higher education institutions and academic organizations becomes an integral part of the innovation chain; and only such institutions involved in educating and training future scientists can provide a realistically adequate setting to respond to the above challenges. This is in addition to the ongoing need for

¹ “Un entretien avec le commissaire européen chargé de la Recherche - L’Europe a plus que jamais besoin de recherche”, *Le Figaro*, 31 January – 1 February 2004, p. 19. For a comprehensive analysis and programmatic formulation of the position of the European Commission see two documents, Communication from Commission – The role of the universities in the Europe of Knowledge. Brussels: Commission of the European Communities, 5 February 2003 and Communication from the Commission to the Council and the European Parliament – Research in the European Research Area: One profession, multiple careers. Brussels: Commission of the European Communities, 18 July 2003.

“reproductive” training, namely of the next generation of university teachers and researchers.

This policy context has drawn increasing attention to a whole range of issues confronting European science, including those related to Doctoral study programmes and the awarding of corresponding degrees and qualifications. For non-European Union countries, additional challenges associated with the consequences of transition [to post-communism for example] include massive external and internal brain drain, a rapid drop in funding levels, inefficient organizational structures, and the threat of unethical conduct by both students and academics. In some countries, the situation has been further aggravated by ethnic conflict.

While considering such developments and challenges, it should also be pointed out that the awarding of “Doctoral qualifications” is intrinsically linked to the history of universities. Take for instance, as a symbolic illustration, the ceremony of awarding a Doctoral qualification and title, and its corresponding privileges, which are as impressive as they are elaborate. Such decorum has a certain rationale, resulting as it does from careful scrutiny, rules and decisions as to who is awarded a qualification and on what basis. These questions are no less valid today than they were in the past; in fact since Doctoral degrees are now almost entirely “research-dependent”, this problem is particularly pertinent. It is quite typical that the award of the Doctoral degree requires successful preparation, and defence, of work meeting the following three main conditions:

- It represents an original solution to the research problem;
- There is a proven record of sufficient knowledge within a given scientific discipline;
- There is proven ability to conduct independent research within a given scientific discipline.

In addition to intellectual capacity, appropriate research training is a lengthy process of self-education, experimentation, and “helpful guidance” from what in the old German universities was described as *Doktor Vater* - nowadays a Doctoral Supervisor or Doctoral Committee. In a more emblematic way, this has also been described by John Ziman, Professor Emeritus at the University of Bristol: “The heart of the PhD experience is the psychological transition from a state of being instructed on what is already known to a state of personally discovering things that were not previously known”². Unless this conversion occurs, it is difficult to expect wholly qualified and capable researchers. It is this very transition which so precisely distinguishes “Doctoral studies” from study programmes at the preceding levels and which poses significant problems with regard to its organization.

² John Ziman, “Competition undermines creativity”, *The Times Higher Education Supplement*, 16 July 1993, p. 16.

While the intrinsic, intimate question of scientific maturing was and remains valid, it is nevertheless important to consider Doctoral studies and degrees in the context of the current environment of higher education and science. This was the climate in which UNESCO-CEPES and the Elias Foundation of the Romanian Academy initiated a project leading to the International Seminar on Doctoral Degrees and Qualifications in the Contexts of the European Higher Education Area and the European Research Area, held in September 2003 in Bucharest.

In order to conduct well-informed discussions at the meeting, thirteen national case studies were commissioned covering the following countries: Austria, France, Germany, Italy, the Netherlands, Norway, Poland, Romania, the Russian Federation, Spain, Sweden, the United Kingdom, and the United States. These countries were selected in order to present a fairly wide range of situations, organizational approaches, policy initiatives, and academic traditions with regard to the structure and awarding of Doctoral degrees. The case study about Doctorates in the United States is relevant in that this country is referred to, sometimes with envy, as a model to be followed.

Beginning with information about general trends and legal and institutional arrangements, the case studies go on to analyze in detail some problems of particular relevance:

- The place of Doctoral studies in the overall structure of programmes offered by higher education institutions;
- The status of persons undertaking studies and research leading to Doctoral qualifications: are they still students, or already researchers?
- The role of institutions other than those of higher education, bearing in mind that in a number of countries Doctoral qualifications can also be earned in academies of science or other research organizations - including the evaluation of Doctoral degrees and qualifications obtained abroad;
- The procedures for the award of Doctoral qualifications, and the role of external bodies in validating them;
- The costs of the research generally required for the award of Doctoral qualifications.

In addition to the national case studies, Professor Barbara Khem of the Centre for Research on Higher Education and Work at the University of Kassel, Germany, has been invited to undertake a comparative analysis of the results. This has been done in order to identify the main challenges and trends in the development of Doctoral studies, particularly from the perspective of the Bologna Process requirements.

The topic of Doctorates is a recurrent subject of interest for UNESCO-CEPES. Ten years ago, UNESCO-CEPES published the results of a very comprehensive study covering 31 countries in the Europe Region; its purpose was to provide a description of the requirements and formal

conditions for awarding Doctoral degrees.³ One of most evident changes since this time is that a number of European countries have dropped “second Doctor’s degrees” - Doctor of Sciences or Habilitation - as prerequisites for an academic career.

On the whole, studies leading to Doctoral degrees in many European countries are presently facing a paradoxical situation. On the one hand there is a general decline of interest in such qualifications among graduates, who view them increasingly as strictly necessary only for an academic career. On the other hand, the reality of knowledge-based economies and a developing “European Research Area” implicitly require consistent, high quality Doctoral-level studies as well as funding schemes for Doctoral and post-Doctoral research projects. A further area of concern is naturally the age-structure of current teaching and research staff in European higher education institutions.

When compared to other programmes, particularly those of leading universities in the United States, a series of problems with European Doctoral degrees is surfacing: dysfunctional relations between various systems; inconsistent standards regarding admission requirements, teaching periods, and theses; and weaknesses in the assessment and control of both quality and relevance.

The amount of individual input needed for successful completion of Doctoral studies, at times competing with professional and personal obligations, is only one cause for attrition. The others may be found “... within the organization and conduct of Doctoral degree programmes”⁴. In this respect the findings of a poll conducted in Poland showed that more than half (52.4 percent) of those participating in Doctoral programmes were facing substantial difficulties related to the following:

- The chosen topic of research for the thesis (20.9 percent);
- Too heavy a teaching load (9 percent);
- Poor relations with supervisors (7.5 percent);
- Poor organization of the Doctoral study programme itself (7.5 percent);
- Other problems directly related to institutional conditions (6 percent).

While percentages may differ, the above problems can most likely be found in any other jurisdiction.⁵ To these are added further problems for

³ Oleg Kouptsov, ed. *The Doctorate in the Europe Region*, UNESCO-CEPES Studies on Higher Education. Metropol: Bucharest, 1994.

⁴ Malgorzata Dabrowa-Szefler, *System kształcenia doktorantów w Polsce - próba oceny na podstawie badań ankietowych* [System of Doctoral Studies in Poland - Preliminary Analyses of Poll Data], *Nauka i Szkolnictwo Wyzsze*, No. 1, 2001, pp. 62-76.

⁵ In addition to psychological hardship due to the prevailing solitude of PhD projects, the author, a Senior Lecturer at the University of Coventry, draws particular attention to the financial hardship of doing a PhD and the need for guidance and mentoring in the organization of PhD studies in the United Kingdom. See, Katharine Sarkakis, “Why I Believe PhD Students Should Be Paid to Study”, *The Times Higher Education Supplement*, 14 May 2004, p. 14.

those who want a period of study abroad, as young researchers who try to develop their qualifications abroad encounter financial, administrative, and social/cultural obstacles.

In order to deal with such problems, certain initiatives have been already proposed. Some European universities have established centres of excellence, Doctoral schools, thematic European Doctoral programmes, and specific incentives for Doctoral/PhD students. Nevertheless more has to be done, and consequently in-depth knowledge of the complex changes in structure and content is necessary.

The diversity of paths leading to a Doctoral degree, combined with the specificity of each national system of higher education covered in this volume, posed a particular set of terminological and editing challenges. These were ably met by Leland Barrows, who recently retired from his position as Senior Editor, here at UNESCO-CEPES.

The accuracy of the information and analyses provided benefited not only from the discussions at the International Seminar on Doctoral Degrees and Qualifications in the Contexts of the European Higher Education Area and the European Research Area, but also from a peer-review to which were subjected all national case studies.

In summary, this volume provides a very solid and updated base of information on principal developments regarding Doctoral and post-Doctoral programmes in the Europe Region. The book will prove an essential reference for discussions concerning the modernization of this area of higher education and, needless to say, this question is vital to the future of higher education and science. Who is and will be engaged in teaching and research, the twin pillars of higher education? Both have direct bearing not only on higher education and science but, not to a lesser extent, on technological and cultural advancement.

Last but not least, it should be mentioned that this publication benefited from financial support kindly provided to UNESCO-CEPES by the German Academic Exchange Service - DAAD, and the Japanese-Funds-in-Trust for the Promotion of International Co-operation and Mutual Understanding.

I. Austria

HANS PECHAR and JAN THOMAS

1. GENERAL FEATURES OF AUSTRIAN HIGHER EDUCATION

There are eighteen public universities in Austria. Twelve of them are research universities (*Wissenschaftliche Universitäten*), and six are universities of arts (*Universitäten der Künste*). The setting up of private universities was authorized in 1999. By June 2003, six (small) private universities had been accredited, all of them non-profit institutions. Enrollments at the public research universities amount to 177,000 students. There are 7,500 students enrolled at the universities of the arts and less than 1,000 students at the private universities.

The most dynamic part of the non-university sector is composed of the polytechnics (*Fachhochschulen*), established in 1993. In addition, there are colleges for teacher training (*Pädagogische Akademien*). These institutions only train teachers for compulsory schooling. The teachers for Gymnasias are trained in universities. The teacher training colleges are not considered to be part of the higher education system; however, the intention is to upgrade these institutions in 2005. Colleges for social workers (*Sozialakademien*) and schools for the paramedical professions (*MTD-Schulen*) also exist and have the same status as the teacher training colleges. All these institutions are public. Enrollment in the *Fachhochschulen* includes 14,000 students enrolled in teacher training colleges, and 4,000 students enrolled in the colleges for social workers and in the schools for the paramedical professions.

For about 150 years, Austrian higher education was shaped by the Humboldtian tradition. In the Austrian context, it is sufficient to emphasize a few points of that tradition, points that should give an impression as to how the Austrian system functioned over the last quarter of the Twentieth Century:

- University governance at universities was characterized by a dualism of political and academic authority: As far as the public interest was concerned, the university was a state agency and was subject to centralized decision-making by legislation and state bureaucracy. Most issues concerning teaching and research were regulated by collegial bodies. Traditionally those bodies were dominated by the academic oligarchy (chairholders). In the last quarter of the Twentieth Century, the non-professorial academic staff was partially included in decision-making.
- Research and teaching at universities were centered on individual professorial chairs that were accorded a high level of authority in their fields of expertise, without any substantial interference from university bodies or government. At the institutional level, the

university, as an organization, was weak. The corporate structures at the university and faculty levels had mainly symbolic functions.

- Federal funding was the sole source of income for universities. Over the last quarter of the Twentieth Century, no tuition fees were charged. Universities received the Federal money in the form of earmarked grants.
- The Government was the employer of academic and non-academic staff. Only temporary staff members were employed on the basis of private contracts, usually within the scope of “third party projects”. Academics were civil servants with lifelong tenure.
- The culture of teaching and learning was dominated by a *laissez-faire* attitude. From the very first semester onwards, students were assumed to be “apprentice researchers”, who were capable of conducting their studies in a completely independent way. Students either attended lectures and seminars or they did not. There were no obligations to take examinations. The duties of academics were equally relaxed. A need for guidance and monitoring by the staff was not normally considered part of the system requirement. Students were not supposed to be pupils who needed help, but mature persons who were expected to be able to learn independently.

2. DOCTORAL STUDIES

Institutions Awarding Doctoral Degrees

Up to the late 1990s, Austrian Doctoral degrees were awarded solely by public universities and – in a few cases – by church-affiliated schools of theology (*Theologische Hochschulen*). The latter were granted a status similar to universities, but their offerings were always limited to theology and philosophy.

As of the late 1990s, the entrance on the scene of the private universities has widened the supply of courses, first by offering several new degrees at Master's degree level, and more recently, by offering a few new Doctoral degrees, as, for example, the Doctorate in “Computer Science in Medicine”. A private University also offered the first PhD degree according to the stipulations of the *Bologna Declaration*, by awarding the international version of this degree.

The thirteen traditional Doctoral degrees awarded by the public universities are all research degrees and therefore are not to be confused with modern professional doctorates (e.g., the EdD., the DMin., and the DBA). Although indicating different areas of study, all Austrian Doctoral degrees have the same formal status and level as the Doctor of Philosophy (*Dr. phil.*); however, they are traditionally named after the faculty

(*Fakultät*)¹ to which the individual degree holder belonged during his Doctoral studies.

During the recent structural reorganizations within the Austrian universities, the Doctoral degrees were not renamed, but still bear the name of the historical faculty to which the very subject in question would have belonged. Apart from this practice, the universities of applied arts, having introduced Doctoral studies later than other universities are also entitled to award Doctorates of Philosophy.

The Research Doctorate

Up to the late 1960s, the Doctorate was the standard (non-research) award for studies at Austrian Universities.² Adopted in 1966, the Basic Law on Studies in Higher Education – *Allgemeine Hochschul-Studien Gesetz* (AHStG) formalized study regulations that previously had been, to a great extent, at the discretion of individual professors. The AHStG introduced the Master's degree (*Magister*) as a standard qualifying degree³ for employment outside academe. The Doctorate was then meant to be a top-up qualification for those wanting to pursue a research career in academe. Nevertheless, the prestige of the Doctoral degree led to a different outcome, as many Doctoral students not preparig for an academic career, but using the degree to improve their market value outside the university.

Owing to the long period of implementation of the AHStG and to the liberal study regulations, which set no strict time limitations, many students were still enrolled in non-research Doctoral studies during the 1970s and 1980s. Even today, the older award system is still in use for those who began Doctoral studies before the AHStG was implemented in their fields of study, and still, every year, a few non-research Doctorates are awarded to these students. Therefore, when investigating the current Austrian Doctoral landscape, one should always look at the “older regulations” for Doctoral studies as well as at the current regulations, for some of the current students might still be studying according to these former regulations.

The Doctorate is not the terminal qualification within the Austrian academic system. Only the *Habilitation*, a kind of senior Doctorate,⁴ gives one the opportunity to be awarded the *venia docendi*, that is, the permission to teach at university level, to conduct one's own research, and to supervise other Doctoral dissertations. Currently, the function and

¹ According to this systematic approach, the *Montanuniversität Leoben* and the *Veterinärmedizinische Universität Wien* may be seen as universities with only one *Fakultät*.

² Apart from this type of Doctorate, State Examinations (*Staatsprüfungen*) constituted a lower qualification which provided professional recognition of university studies, but did not lead to an academic degree.

³ The new regulation was introduced for most of the subjects that could be studied in Austrian universities at the beginning of 1966, except for studies in Medicine.

⁴ The *Habilitation* does not lead to the award of another academic degree, but is, in some respects, a professional qualification for university professors.

status of the *Habilitation* are changing, and there are even suggestions that it be abolished. Doing so might require the improvement of the Austrian Doctorate so as to make it the terminal qualification within the system.

3. ACCESS TO DOCTORAL STUDIES

Austria still guarantees open access to studies at universities at all levels if entrance requirements are met. To enter a so-called diploma-programme (*Diplomstudium*) leading to a Master's degree, the *Matura* is required. Similarly, every Austrian who has successfully completed a Master's degree (*Magister*) can then enroll in a Doctoral programme.⁵

The conditions would be similar for foreign students having earned their degrees at accredited universities outside Austria, but they have to demonstrate that they would be admitted for studies at the same level in their home countries or at the foreign university which has conferred their highest degree. If that foreign university were to set a requirement for additional coursework before a student could enter another level of study, he or she would have to satisfy those requirements before entering a university in Austria, and do so at the foreign university.⁶ In the case of admission to Doctoral studies, the student would have to submit "an admission certificate (an official statement of acceptance issued by a university) to a Doctoral programme from a university in the country that issued the secondary school leaving certificate" (University of Vienna, 17 November 2003).

To be precise, in many cases, the decision as to university entrance for foreign students in Austria is mainly based on regulations emanating from foreign countries, which necessarily vary from country to country or from one foreign institution of higher education to another. This regulation significantly restricts and complicates the enrollment of foreign students. No exception is made for students from the European Union, which is probably a violation of the European Union regulation on non-discrimination.⁷

A distinct characteristic of the Austrian Doctorate might be the above-mentioned guaranteed access to Doctoral studies for every Austrian who has successfully completed a *Diplomstudium*. In other words, any Austrian who has completed a university programme at Master's degree level in Austria or who can present a recognized foreign qualification of the same level is admitted to Doctoral studies.

Usually, it is up to the student to find a supervisor for his or her thesis. The need to be accepted by a supervisor gives the university a certain

⁵ In case a Doctoral student cannot find a supervisor, the Dean of Studies (*Studiendekan*) must appoint a supervisor from the given faculty.

⁶ See: "Das Doktoratsstudium an der Universität Innsbruck, Informationen für Studienbewerber mit einem ausländischen akademischen Abschluss": <http://www2.uibk.ac.at/studienabteilung/de/formulare_und_merkblaetter.html> (17 November 2003).

⁷ A student has filed an action in the European Court. A judgment is expected over the next few years.

discretion as to the admission of students and the possibility to act as a gatekeeper for able students. In most cases, students who are not accepted by a supervisor are “cooled out” and abandon any ambitions of pursuing Doctoral studies. However, if a student insists, he or she has the right to appeal to the Dean of Studies (*Studiendekan*), who will then assign a supervisor to the student.

Access to Doctoral studies is also provided to graduates of Austrian *Fachhochschulen* (polytechnics). As the latter do not have the right to offer their own Doctoral programmes, their graduates can only proceed to the Doctoral level by matriculating at one of the Austrian Universities. The only difference is that since *Fachhochschulstudien* (degree programmes at *Fachhochschulen*) are regarded as being shorter than university studies, the workloads of *Fachhochschule* graduates in terms of required courses are significantly higher than those of university graduates.⁸ Currently, only graduates of *Fachhochschul*-programmes in the Social Sciences, in Business Studies, and in Engineering are eligible to progress to Doctoral studies at a university.⁹

An open question is access to Doctoral studies for graduates from teacher training colleges (*Pädagogische Hochschulen*), as their study programmes have a duration of only three years and do not lead to an academic degree. Therefore, these programmes are (sometimes) regarded as being of sub-academic standard. This situation suggests that it is desirable to think about an official introduction of professional degrees in Austrian higher education, for example, in this case, a Bachelor of Education.

Given the current regulations, the graduates of teacher training colleges are forced to start university-level studies all over again, meaning that absolutely no previous coursework is credited towards the university degree, with the effect that teachers would normally need a minimum of four more years of full-time study to complete a *Diplomstudium* (Master's degree) before being able to continue their Doctorates in a minimum of two more years.

As European law has improved the recognition of qualifications within Europe, German universities are another good choice for Austrian teachers wishing to enter Doctoral studies. The University of Passau (Germany), on the Austrian border, is at the forefront of international opportunities. It has not only welcomed Austrian teachers as research

⁸ This load may be up to forty-four additional semester-hours spread over two semesters for *Fachhochschulen* graduates. Unlike the regulations for other Doctoral students, here there is no free choice for these courses, see: *Technical University of Vienna*: <<http://info.tuwien.ac.at/histu/mb/1996/STM-3.html>> (17 November 2003).

⁹ See: *Verordnung: Doktoratsstudium für Absolventinnen und Absolventen von Fachhochschul-Studiengängen wirtschaftlicher Richtung* <www.mci.at/fh/pdf/vo_doktorat_wirt.pdf> (17 November 2003).

students,¹⁰ but has also benefited very much from their input and their professional competencies.

Organization and Present Regulations

Doctoral programmes serve the development of independent research skills and the training and promotion of future scientists. Doctoral programmes consist of three main parts: participation in seminars, writing a dissertation, and taking Doctoral examinations (*Rigorosen*). The dissertation proves the ability to solve scientific problems (University of Vienna, 17 November 2003).

The basic formal regulations for Doctoral studies at Austrian Universities are found in the *Universitäts-Studiengesetz (UniStG)*¹¹ and in the *Universitätsgesetz 2002*.¹² The local regulations, usually based in the context of a faculty (*Fakultät*) or institute and normally focused on subjects that would also be available at Master's degree level, are necessarily interpretations of the general rules.¹³

Students are generally permitted to choose the topics of their theses freely and are also entitled to choose their individual supervisors. The supervisor will later also be the first examiner for the thesis and for the final oral examinations as well. The student may also make proposals regarding the second examiner.¹⁴ If no supervisor can be found for the suggested topic, the dean of studies (*Studiendekan*) can assign a supervisor of his or her choice.

All examiners need to have earned the terminal academic qualification (*Habilitation*) or its equivalent in foreign countries. It might be an interesting point, that, theoretically, the two supervisors need not be formally affiliated with the particular university in which the student is matriculated.

¹⁰ In this case, graduates of Austrian teacher training programmes are given the same status as graduates of German *Fachhochschulen* (polytechnics). Thus, it is unnecessary for them to first study for a Master's degree. Also, the German universities are much more open to the recognition and the appreciation of coursework undertaken at teachers colleges than Austrian universities are.

¹¹ *Bundesgesetz über die Studien an den Universitäten (Universitäts-Studiengesetz - UniStG)* 1997 [with several alterations up to 2002]: <<http://www.bmbwk.gv.at/start.asp?isllink=1&bereich=7&l1=1101&l2=1108&l3=4257&OID=4296#>> (17 November 2003).

¹² *Bundesgesetz über die Organisation der Universitäten und ihre Studien (Universitätsgesetz 2002)*: <<http://www.bmbwk.gv.at/start.asp?isllink=1&bereich=7&l1=1101&l2=1108&l3=4257&OID=7724#>> (17 November 2003)

¹³ Schratz refers to a debate about the interpretation of a passage of the former law, which was definitely not precise. For a short period, a few Doctoral students took it literally and refused to undergo the assessment in their courses, as the law only stated that Doctoral students would have to register (*"inscribieren"*) for courses in the amount of 14 credit hours, not precisely indicating that successful completion would be necessary. See Schratz (1994), p. 212.

¹⁴ "The chosen topic and the supervisor are considered accepted, if the Dean of Studies does not object within one month after the notice was received." <http://www.univie.ac.at/studentpoint/artikel/art_list.php?Stil=14&Alias_ID=364> (17 November 2003).

Although a rough review of current Doctoral regulations reveals many similarities, as, for example, a total duration of four semesters (two years),¹⁵ there are striking differences regarding the workload students must complete by attending courses. The load varies from three courses (six credit hours) to eleven courses (twenty-two semester hours). Differences will also be found in the more or less elaborated specifications on these mandatory courses and in their arrangement.

Typical Examples

The regulations for Doctoral studies at the Institute of Journalism and Communication Science at the University of Vienna (*Institut für Publizistik- und Kommunikationswissenschaft*) within the Department of Humanities and Social Sciences (*Fakultät für Human- und Sozialwissenschaften*)¹⁶ are cited below.

The duration of Doctoral studies, including the time for preparing the thesis, is two years (four semesters). During this period, a workload of twelve semester-hours¹⁷ (*Semesterstunden*) has to be successfully completed. One-third of these courses must be seminars for Doctoral students, another third are research seminars. The remaining two courses may be lecture courses or seminars with a close link to the theory and/or methods used for the individual thesis.

In case the thesis varies greatly from the subject the student has studied at Master's degree level, two more courses chosen by the commission for Doctoral studies can be made mandatory so as to improve the expertise of the Doctoral student in regard to special research skills and specialized knowledge in the field of his or her dissertation traces.

According to this particular regulation, the above-mentioned seminars are clearly described as open only to Doctoral students, a rule that is not commonly found in departmental regulations. In many cases, Doctoral students have to pick a majority of their mandatory seminars from Master's degree-level courses.

Apart from mandatory coursework, students may also choose specific courses with a link to their field of specialization. These will be cited in the certificate provided after the *Rigorosum*. Interestingly, the results of the assessment of the mandatory courses form an integral part of the grades the student will finally receive on the oral Doctoral examinations.

¹⁵ Up to the recent past, even this statement would not have been accurate, since the regulations for Doctoral studies in the Department of Law of the University of Innsbruck provided for a duration of only one year. Quite a number of current regulations state that the usual length of four semesters can be shortened, in case a student can demonstrate that he or she has successfully completed his or her coursework and his or her thesis in less time.

¹⁶ *Studienplan Doktoratsstudium* <<http://www.univie.ac.at/Publizistik/StudiumDoktorneu.htm>> (17 November 2003).

¹⁷ This load is usually the equivalent of six semester-long courses of two hours weekly during the term.

The regulations for Doctoral studies in Social Sciences and in Business Economics at the University of Graz¹⁸ give a precise description of different types of courses and lessons suitable to Doctoral studies and their purpose:

Table 1. Types of Doctoral courses at the University of Graz

Lectures	Presentation of internationally recognized knowledge at a high level and, if possible, with the participation of practicing specialists from outside the university
Seminars [*]	Research skills and methodology training
<i>Privatissima</i>	Support for and survey of the progress of students working in small groups
Research colloquia	Monitoring of student progress by external academic experts

^{*}Including courses with lectures.

Source: The authors.

A larger part of the above-mentioned courses, although mandatory in terms of the numbers of credit hours, can be chosen freely from the whole range of courses available so long as they correspond to the subject of the individual thesis in point of course contents or by tracing research skills appropriate to the subject.

Thus, contrary to the precisely patterned studies up to the Master's degree level, the regulations for Doctoral studies are to be regarded as a "loose framework" (Schratz, 1995, p. 207), leaving a great deal of choice and freedom to the individual Doctoral student. One might argue that Austrian public policy was much more interested in increasing the academic output rate for the general labour market than in guaranteeing proper and sufficient research training for academic regeneration.

In addition, the popularity of Doctoral studies is mainly to be found in the great prestige of academic degrees in Austria. It may not always be accompanied by a strong interest in academic research.

4. RECOGNITION OF FOREIGN DEGREES

A unique regulation for the validation of foreign degrees is the so-called *Nostrifikation*. Originally, this process led to the formal recognition of academic studies at Doctoral level and was terminated by the re-conferring of the same or a similar degree in an official degree-granting ceremony by the University of Vienna. Later, this procedure was adapted to Master's degrees, and it is currently in progress for the Bachelor's degree. Nowadays, all Austrian public universities are entitled to validate foreign degrees, but *Nostrifikation* is no longer linked to a formal academic degree-granting ceremony. It only leads to the right to hold the Austrian version of an academic foreign degree.

Progress in the recognition of degrees in the European Higher Education Area has also made it possible for the titles to be used in the very way they were conferred by recognized academic institutions in other

¹⁸ <<http://www.uni-graz.at/zvwww/studplan/spdrsowi02.html>> (17 November 2003).

European countries. In all these cases, *Nostrifikation* is not necessary and therefore no longer possible. An exception can only be made if an applicant can prove that a validated academic degree is necessary for certain professional positions or for access to a limited number of continuing education programmes¹⁹ still requiring an Austrian or a “*nostrifizierte*” academic degree. *Nostrifikation* is still common if the degree was awarded outside the European Union.

Apart from formal requirements, the *Nostrifikation* of a degree can be of significant value for holders of foreign degrees. Austrian society appreciates the value of academic titles very much. The value of an Austrian Master’s degree (*Magister*) and of its “*nostrifizierte*” version can be demonstrated by the fact that Austrian citizens carry this title as a constituent part of their family names, while in many other countries such a privilege is only granted to holders of a Doctorate.²⁰

Table 2. Doctoral degrees currently being awarded by the Austrian state institutions of higher education

<i>Doktorgrade</i> (Field of Study)	Doctoral degree (Abbreviated)
<i>Doktor/Doktorin</i> ¹ <i>der Bodenkultur</i> (Agricultural Sciences)	<i>Dr. nat. techn.</i>
<i>Doktor/Doktorin der gesamten Heilkunde und der medizinischen Wissenschaft</i> (Medicine and Medical Science)	<i>Dr. med. univ. et scient. med.</i>
<i>Doktor/Doktorin der medizinischen Wissenschaft</i> (Medical Science)	<i>Dr. scient. med.</i>
<i>Doktor/Doktorin der montanistischen Wissenschaften</i> (Mining Sciences)	<i>Dr. mont.</i>
<i>Doktor/Doktorin der Naturwissenschaften</i> (Natural Sciences)	<i>Dr. rer. nat.</i>
<i>Doktor/Doktorin der Philosophie einer Katholisch-Theologischen Fakultät</i> (Philosophy at a Catholic Faculty of Theology)	<i>Dr. phil. fac. theol.</i>
<i>Doktor/Doktorin der Rechtswissenschaften</i> (Law)	<i>Dr. iur.</i>
<i>Doktor/Doktorin der Sozial- und Wirtschaftswissenschaften</i> (Social Sciences and Economics [or Business Sciences])	<i>Dr. rer. soc. oec.</i>
<i>Doktor/Doktorin der technischen Wissenschaften</i> (Technology [or Engineering])	<i>Dr. techn.</i>
<i>Doktor/Doktorin der Theologie</i> (Theology) ²	<i>Dr. theol.</i>
<i>Doktor/Doktorin der Veterinärmedizin</i> (Veterinary Medicine)	<i>Dr. med. vet.</i>
<i>Doktor/Doktorin der Zahnmedizin und der medizinischen Wissenschaft</i> (Odontology and Medical Science)	<i>Dr. med. dent. et scient. med.</i>

¹ All degrees mentioned are formally awarded in a personalized male or female version: *Doktor* or *Doktorin*.

² Either Catholic or Protestant.

Source: <<http://www.bmbwk.gv.at/start.asp?bereich=7&OID=5793&l1=6367&l2=6370&l3=6380>> (17 November 2003).

¹⁹ Prospective Doctoral students with foreign Master’s degrees need not (and cannot) validate their degrees unless they can demonstrate a professional need or requirement for doing so, apart from their Doctoral studies.

²⁰ In the past, the nature of degrees being a part of one’s name has also led to an Austrian peculiarity at Doctoral level: wives of husbands with Doctoral degrees were officially entitled to use their husbands’ Doctoral title as if it were a constituent part of the family name (I).

Table 3. Survey of present Doctoral degrees awarded by Austrian Church-Affiliated Schools of Theology (*Theologische Hochschulen*)

<i>Doctoral degrees</i> (Field of Study)	Doctoral degree
<i>Doktor/Doktorin der Theologie</i> (Theology)	<i>Dr. theol.</i>

Source: <<http://www.bmbwk.gv.at/start.asp?bereich=7&OID=5793&I1=6367&I2=6370&I3=6380>> (20 November 2003).

Table 4. Survey of present Doctoral Degrees awarded by Austrian private universities

<i>Doctoral degrees</i> (Field of Study)	Doctoral degree
Doctor of Philosophy	<i>Ph.D.</i>
<i>Doktor/Doktorin der gesamten Heilkunde</i> (Medicine)	<i>Dr. med. univ.</i>
<i>Doktor/Doktorin der Medizin-Informatik</i> (Computer Science in Medicine)	<i>Dr. med. inf.</i>
<i>Doktor/Doktorin der Theologie</i> (Theology)	<i>Dr. theol.</i>

Source: <<http://www.bmbwk.gv.at/start.asp?bereich=7&OID=5793&I1=6367&I2=6370&I3=6380>> (20 November 2003).

5. PROBLEMS AND CHALLENGES

What applies to Germany can also be applied to Austria: "Most aspects of university life have to be legally waterproof whereas the important task of training and recruiting future generations of scientists and scholars is left considerably to individualized and arbitrary decision-making" (Gellert, 1993, p. 62).

Supervision mainly has the shape of a hierarchical relationship between two persons, with many difficult aspects, since in Austria (unlike the situation in the many other countries) the supervisor, the examiner, and the mentor are the one and the same person.

Teachers have little time for supervision, partly because most of their energy is needed for coping with their undergraduate teaching responsibilities. There is no professional preparation for supervision. Students describe postgraduate research as a very lonely activity.²¹ Especially in the Social Sciences and in the Humanities, involvement in research projects is rare. But not only the students are left by themselves. Supervisors, also, receive no professional feedback. Teaching at all levels is viewed mainly as a private matter. There is hardly any professional discussion about how to supervise. There are no jointly set up institutional standards for supervision or joint seminars for Doctoral students.

²¹ See: "*Initiative zur Sichtbarmachung von DissertantInnen am Institut für Politikwissenschaft*": <<http://www.political-science.at/phd-initiative/sichtbar.htm>> (17 November 2003) and "*Der Dissertationsprozess und seine Folgen für Leib und Seele*": <<http://www.political-science.at/phd-initiative/dissprozess.htm>> (17 November 2003).

Students take a long time to finish their studies, partly because no systematic financial support is provided for them. Tables 5 and 6 portray the average age of Doctoral graduates and the duration of their Doctoral studies. The average Doctoral graduate receives his or her qualification at the age of 32. The group of women as Law students is the youngest, on average, being about 28 years of age at the date of completion. Having the longest average duration of studies of around eleven semesters, the average age of Doctoral graduates in Theology is over 40. The average duration of Doctoral studies in all disciplines is 7.6 semesters.

Table 5. Graduates of Doctoral studies by field of study and by age (academic years 2000-2001 and 2001-2002)

Field of study	2000-2001			2001-2002		
	Men	Women	Total	Men	Women	Total
Theology	40.23	43.71	40.87	40.83	33.40	39.77
Law	29.53	28.10	29.00	30.30	27.89	29.38
Social Sciences and Economics	32.06	30.61	31.58	31.73	31.57	31.68
Humanities and Natural Sciences	33.82	34.24	34.04	35.24	33.86	34.56
Engineering Sciences	31.29	30.93	31.25	31.69	30.52	31.53
Mining and Metallurgy	33.34	-	33.23	33.21	33.25	33.21
Agricultural Sciences	33.31	31.18	32.55	34.73	32.42	33.86
Veterinary Medicine	32.05	29.31	30.31	30.48	30.15	30.26
Total	32.24	32.34	32.27	32.98	32.02	32.62

Source: BmBWK, 2002.

Since there are many structural barriers, Doctoral training is rarely interdisciplinary. Another point of criticism is that extramural, non-university demand is insufficiently taken into account. Since studies are not divided into undergraduate and postgraduate segments, the profession-oriented student is educated in the same way as the research-interested student.

In most cases, little effort is devoted to the question of how the principle of the unity of research and teaching can be meaningfully adapted to the realities of the mass university. Just to proclaim that unity has often led to the paradoxical consequence that neither students at undergraduate level are taught in very thoughtful ways, nor are students at the Doctoral level sufficiently initiated into research methods. Since it is assumed that a holder of a Master's degree has learned how to do research, there is no formal introduction to research at the beginning of Doctoral training. Austrian Doctoral studies are organized on the basis of a very unregulated *curriculum*.

Students only have a few opportunities to share their experiences and to obtain feedback. Compared to the Anglo-American situation, they have far fewer opportunities to present lectures or to attend conferences. There are, of course, great differences among disciplines. In the Natural Sciences, team research is more common and Doctoral students are integrated into

research teams. This way of proceeding is not common in the Humanities and the Social Sciences.

Table 6. Graduates of Doctoral studies and the duration of their studies in semesters (academic year 2000-2001)

	Sex	Average duration of studies		
		Graduates	Median	Average
Catholic Theology	men	28	9.5	10.7
	women	7	8.5	11.6
	total	35	9.5	10.9
Philosophy (in Departments of Theology)	men	3	3.5	3.5
	total	3	3.5	3.5
Law	men	233	5.5	6.4
	women	138	5.5	5.9
	total	371	5.5	6.2
Social Sciences and Economics	men	158	5.5	6.9
	women	77	7.5	8.4
	total	235	6.5	7.4
Humanities and Natural Sciences	men	405	7.5	8.2
	women	440	7.5	8.6
	total	845	7.5	8.4
Engineering	men	358	7.5	7.6
	women	40	6.5	8.1
	total	398	7.5	7.6
Mining and Metallurgy	men	29	6.5	6.3
	women	1	7.5	7.5
	total	30	6.5	6.3
Agricultural Sciences	men	62	7.5	7.7
	women	34	6.5	7.2
	total	96	7.5	7.5
Veterinary Medicine	men	20	6.0	6.0
	women	35	5.5	5.4
	total	55	5.5	5.6
Natural Sciences	men	7	4.5	5.4
	women	3	7.5	7.8
	total	10	5.5	6.1
Philosophy	men	1	2.5	2.5
	total	1	2.5	2.5
Total	men	1,304	6.5	7.5
	women	775	6.5	7.9
	total	2,079	6.5	7.6

Source: BMBWK, Abt. VII/9, 2002.

The open access mentioned above causes many problems in those subjects including departments with many students and a very high teacher/student ratio. High enrollment levels do not automatically lead to enhanced funding or additional staff.

An example: The Institute of Political Science of the University of Vienna (*Institut für Politikwissenschaft der Universität Wien*) offers one of these popular subjects at a location that is particularly attractive. In the winter of 2002, 3,904 students were enrolled in this field of study, of which 362 were only beginning their studies. At the same time, the institute had only eleven (!) staff members: five professors, four assistants, and two other

academic staff members.²² A very heavy student/teacher ratio is a severe problem at all levels of studies. However, Doctoral studies are affected in a particular way, because these studies have a clear need for intense supervision. If supervisors are unable to spend at least a minimum amount of time with individual students, the quality of Doctoral training is in danger.

A comparison with a similar²³ subject, Law studies at the University of Graz, with almost similar levels of student enrollment, shows a strong disparity: 3,996 Law students at the University of Graz (including 377 beginning students in the winter of 2002) who were taught and supervised by 105.5 staff members (31 professors, 72.5 assistants, and 2 scientists during that period).²⁴

Figure 1 below portrays the striking differences in the student-staff ratios at different departments of one particular institution, the University of Vienna. The range lies between 20 students per fully-qualified professor in Protestant Theology and 415 students per professor in the Humanities and the Social Sciences.

Although Austrian regulations do not officially permit part-time student status at any stage of regular university programmes, certain characteristics of Doctoral studies reveal a number of signs indicating this mode of study. A definite proof of this reality is the fact that most of the regulations concerning Doctoral studies advise the scheduling of all mandatory courses during the late afternoon, so that working students can attend.²⁵

An unfortunate consequence of the unofficial character of part-time studies is that working adults, who are at the same time enrolled as university students, cannot normally receive payment from the public unemployment insurance fund, even though they will have paid their contributions.²⁶ As Austrian social law generally regards them as full-time students, there is no secure protection for them in case of unemployment.

Withdrawal from a university for the duration of a period of employment is not a premium choice, for, when resuming their studies, such students would have to rearrange their studies according to the latest regulations regarding their subjects, which might vary significantly from their previous situation in terms of coursework. An official recognition of the "working

²² *Die MitarbeiterInnen des Instituts für Politikwissenschaft des Universität Wien: Stellungnahme zur Situation des Instituts für Politikwissenschaft. Wien, am 2. April 2003:* <<http://www.univie.ac.at/politikwissenschaft/Stellungnahme.pdf>> (17 November 2003).

²³ Both being "paper and pencil studies".

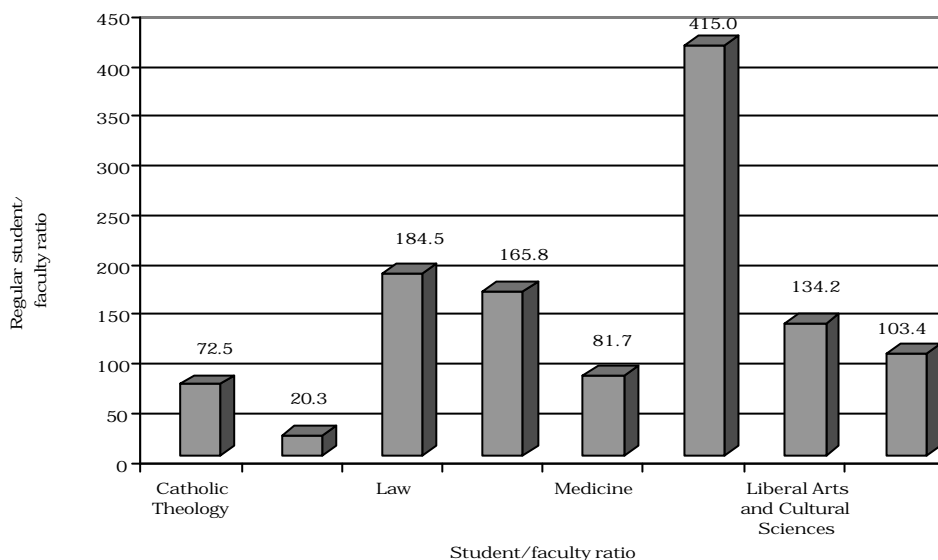
²⁴ *Die MitarbeiterInnen des Instituts für Politikwissenschaft des Universität Wien: Stellungnahme zur Situation des Instituts für Politikwissenschaft. Wien, am 2. April 2003:* <<http://www.univie.ac.at/politikwissenschaft/Stellungnahme.pdf>> (17 November 2003).

²⁵ Some older regulations even considered Saturdays as appropriate days for these lessons. See: "*Institut für Publizistik und Kommunikationswissenschaft der Universität Wien*": <<http://www.univie.ac.at/Publizistik/StudiumDoktorneu.htm>> (17 November 2003).

²⁶ Apart from that, they would also have to pay medical insurance on their own, while all the other registered unemployed receive free medical treatment.

student” status, which leads out of this problematic situation, occurs only under special circumstances.²⁷ Most probably, a large number of students would not meet all these requirements.

Figure 1. Regular student/faculty ratio at the University of Vienna by department, winter 2001.



Source: BMBWK, 2002.

6. RECENT DEVELOPMENTS

Universities – from State Agencies to Public Enterprises

During the late 1980s, a dramatic shift in the paradigm of higher education policy took place. Within only a few years, the architecture of Austrian higher education was fundamentally changed. In the early 1990s, a non-university sector (NUS) was established in order to provide a new educational profile (short-term studies with a clear vocational orientation). With respect to management issues, *Fachhochschulen* were an unexpected break with the tradition of state agencies. In 1993, at the time of their establishment, *Fachhochschulen* were, in some respects, regarded as a model for universities. At the same time, an initial attempt was made to reshape the organization of and the decision-making structures in universities. The government intended to strengthen the managerial elements at the top of the university and to create new links between the

²⁷ For example, the “working student” (*Werkstudent*) status is automatically lost if the only reason for leaving employment is the desire to complete a degree (!) or if there are significant gaps between different previous jobs – quite a common situation with many students.

university and external stakeholders (governing boards). Policy-makers claimed to be responding to academic requests for additional autonomy. Academics, however, opposed that policy on the basis of fundamentally different concepts of autonomy (institutional *versus* collegial/individual autonomy).

A first step in the new direction was the *Universities Organization Act* 1993 (UOG, 1993), which was basically a compromise between the managerial approach of the government and the resistance of all academic groups to this policy. The UOG 1993 strengthened the position of the rector but still left significant power and voice to the collegial bodies. One of the most important consequences of the UOG 1993 was the emergence of a new group of actors – the new rectors and their networks – representing interests and positions that crossed the usual frontier between the government and the universities. It was this group who initiated a debate which finally resulted in a much more radical reform of university organization. The *Universitäts-Studiengesetz* 2002 (UG, 2002) probably brings the most dramatic changes to Austrian universities since the mid-Nineteenth Century (when they adopted the Humboldtian model). The implementation of this new act begins in 2004.

The most important changes are the following:

- Universities cease to be state agencies and receive full legal status. However, they will not be privatized; they will remain in the domain of public law, but will be “legal persons under public law” (*Körperschaften öffentlichen Rechts*).
- The Federal government retains the responsibility for basic funding, but universities are relieved of the fiscal regulations of the federal budget (*Kameralistik*) and instead receive a lump sum budget to be spent at their own discretion. Resources are to be allocated on the basis of performance contracts. Twenty percent of the budgeted allocation will be based on indicators.
- The internal organization of universities – other than the general regulations regarding the decision-making structure – is not prescribed by law. The organizational details are to be determined by a statute (*Satzung*) decided by the academic senate.
- For each university, a governing board (*Universitätsrat*) is established. The size of a board is to vary between five and nine members, according to the institutional statute; half of the members should be elected by the academic senate, and the other half appointed by the Minister.
- The position of the rector is strengthened; he or she is to be elected by the board and thus be more independent of all collegial academic bodies than before.

The new university, having full legal entity status, will be the employer of all academic and non-academic staff. Academics will no longer be civil servants but will be employed according to private contracts.

For better or for worse, the new act probably makes Austria a leader in the “managerial revolution” in Europe. Other – previous – reform steps which fit in the same policy pattern were the following:

- In 1999, the *Universitäts-Akkreditierungsgesetz* (UniAkkG) laid the legal foundations for private universities; previously, the university was a monopoly of the Federal government.
- In 2000, tuition fees (€363 per semester) were introduced (after 30 years of cost-free higher education).

The introduction of tuition fees had a clear impact on the total numbers of Doctoral students. Table 7 indicates that the total numbers of Doctoral students in Austria had more than doubled between 1990-2001 and 2000-2001. In later years, one observes a significant decrease from more than 25,000 to around 15,500 Doctoral students. This downward shift leads to the assumption that most probably the majority of the dropouts were inactive students who were not willing to pay fees to continue their *pro forma* registrations.

Table 7. New entrants, students, and graduates in Doctoral studies by field of study. Academic years 1990-1991 through 1995-1996 (Part I) and 2000-2001 through 2002-2003 (Part II)

Field of study group		1990-1991			1995-1996		
		Men	Women	Total	Men	Women	Total
Theology	New entrants	80	23	103	81	38	119
	Students (winter term)	338	83	421	449	114	563
	Graduates	24	7	31	35	3	38
Law	New entrants	509	239	748	671	449	1,120
	Students (winter term)	1,217	577	1,794	1,905	1,136	3,041
	Graduates	126	46	172	198	62	260
Social Sciences and Economics	Beginners	690	294	984	749	441	1,190
	Students (winter term)	1,882	810	2,692	2,563	1,446	4,009
	Graduates	137	32	169	173	60	233
Medical Sciences (Human)	New entrants	-	-	-	-	-	-
	Students (winter term)	-	-	-	-	-	-
	Graduates	-	-	-	-	-	-
Humanities and Natural Sciences	New entrants	676	812	1,488	864	1,169	2,033
	Students (winter term)	2,049	2,337	4,386	3,484	4,367	7,851
	Graduates	210	92	302	338	239	577
Engineering	New entrants	631	110	741	843	152	995
	Students (winter term)	2,038	251	2,289	3,273	497	3,770
	Graduates	234	25	259	297	40	337
Mining and Metallurgy	New entrants	21	2	23	25	6	31
	Students (winter term)	63	4	67	115	13	128
	Graduates	22	-	22	25	3	28
Agricultural Sciences	New entrants	101	35	136	144	58	202
	Students (winter term)	262	87	349	487	159	646
	Graduates	30	9	39	46	19	65
Veterinary Medicine	New entrants	58	47	105	85	90	175
	Students (winter term)	131	76	207	198	209	407
	Graduates	23	14	37	29	35	64
Total	New entrants	2,766	1,562	4,328	3,462	2,403	5,865
	Students (winter term)	7,980	4,225	12,205	12,474	7,941	20,415
	Graduates	806	225	1,031	1,141	461	1,602

Part II

Field of study group		2000-2001			2001-2002			2002-2003		
		Men	Women	Total	Men	Women	Total	Men	Women	Total
Theology	New entrants	75	28	103	49	25	74	52	17	69
	Students (winter term)	452	117	569	319	76	395	296	81	377
	Graduates	25	10	35	31	7	38	30	5	35
Law	New entrants	681	680	1,361	508	436	944	384	377	761
	Students (winter term)	2,622	1,973	4,595	1,556	1,118	2,674	1,466	1,168	2,634
	Graduates	193	111	304	233	138	371	230	141	371
Social Sciences and Economics	Beginners	643	409	1,052	509	292	801	475	354	829
	Students (winter term)	2,529	1,508	4,037	1,340	691	2,031	1,504	841	2,345
	Graduates	148	51	199	158	77	235	174	74	248
Medical Sciences (Human)	New entrants	-	-	-	-	-	-	49	57	106
	Students (winter term)	-	-	-	-	-	-	30	37	67
	Graduates	-	-	-	-	-	-	-	-	-
Humanities and Natural Sciences	New entrants	993	1,588	2,581	747	1,137	1,884	804	1,185	1,989
	Students (winter term)	4,237	5,979	10,216	3,033	3,939	6,972	2,910	3,941	6,851
	Graduates	361	359	720	413	443	856	441	428	869
Engineering	New entrants	771	174	945	572	127	699	621	158	779
	Students (winter term)	3,509	695	4,204	1,919	375	2,294	1,825	404	2,229
	Graduates	319	57	376	358	40	398	333	54	387
Mining and Metallurgy	New entrants	46	9	55	43	4	47	58	4	62
	Students (winter term)	191	26	217	153	24	177	146	24	170
	Graduates	16	1	17	29	1	30	34	4	38
Agricultural Sciences	New entrants	121	80	201	67	57	124	93	64	157
	Students (winter term)	606	295	901	338	182	520	288	173	461
	Graduates	57	27	84	62	34	96	55	33	88
Veterinary Medicine	New entrants	36	96	132	34	103	137	39	79	118
	Students (winter term)	141	263	404	97	224	321	96	224	320
	Graduates	23	32	55	20	35	55	29	60	89
Total	New entrants	3,366	3,064	6,430	5,303	3,827	9,130	2,575	2,295	4,870
	Students (winter term)	14,287	10,856	25,143	8,755	6,629	15,384	8,561	6,893	15,454
	Graduates	1,142	648	1,790	1,304	775	2,079	1,326	799	2,125

Source: BMBWK, 2002.

The Bologna Process

Several amendments to the *Universitäts-Studiengesetz* (UG, 1997), originally decreed in 1997, have introduced the three-stage system of degrees into Austrian universities, something that is also confirmed in the *Universitätsgesetz 2002* (UG, 2002), effective as of January 2004.

Both Laws entitle the departments (*Fakultäten*), along with the local commission for studies (*Studienkommission*), to request the conversion of Master's degree programmes (*Magisterstudiengänge*) into a Bachelor's/Master's degree-system according to the Bologna Declaration.²⁸ The new *Universitäts-Studiengesetz* (UG, 2002) stipulates that, in most disciplines,

²⁸ According to the three-step-Bologna model, it is clearly stated that the Master's degree will still be a necessary requisite to proceed to Doctoral level studies.

new programmes may only be developed within the Bologna framework, while it remains optional for existing programmes to adopt the new structure. The decision for a change is up to the boards mentioned above. Current experience (2003-2004) indicates that only a few institutions have, so far, made use of their right to do so.

Another consequence of the UG 2002 is that public universities are now entitled to offer PhD programmes, in addition to the currently established Doctoral degree programmes. Both programmes lead to Research Doctorates. They vary in terms of workload size. The PhD represents 240 ECTS; the traditional Doctorate, 120 ECTS.

Innovations and Innovative Programmes

During the 1990s, some new ideas materialized in Austria; however, one should understand that these innovations were not of a general character and did not affect the majority of Doctoral students. Most of the changes in carried out in this period dealt with giving more detailed information (or regulations) about coursework. A few changes were made to eliminate significant differences in the same subject simultaneously offered by different universities.

Still, one of the rare examples of true innovation in departmental regulations was a small, but significant, change concerning the mandatory coursework offered by the Institute of History of the University of Vienna. The Institute had reduced the amount of coursework to three mandatory courses. Instead of completing additional coursework, each student could present a Doctoral project during a national or international conference or research meeting to a broader scientific audience (*Studienplan des Doktoratsstudiums*, 1993).

Another, less unexpected, novelty has been the introduction of the European Credit Transfer System (ECTS) in all new regulations for Doctoral studies.

The University of Graz accords a total of 120 credit points for the Doctorate in Catholic Theology.²⁹ The work on the thesis itself carries twenty-two points per semester; each of the six mandatory semester-hours of courses counts for another two points, and the final oral examination is worth twenty points.

The calculation of credit point values at the University of Vienna is significantly different: The department of History awards a total ninety-six points for the thesis and four points for every mandatory credit-hour. In case the commission prescribes two additional courses, the thesis would only weight 90 points. Additional coursework according to individual decisions and choices, not counted for ECTS-credit in other regulations, is worth 1.5 points per semester-hour in Vienna.³⁰

²⁹ <<http://www.kfunigraz.ac.at/zvwww/studplan/sptheold.html>> (17 November 2003).

³⁰ <http://www.univie.ac.at/Geschichte-Meta/studium/s_sp_dokt.html> (17 November 2003).

Not considering that the two examples come from different subjects and avoiding any deeper analysis of these practical interpretations of the ECTS-system, one can still assume that significant problems could arise when attempting to transfer Doctoral study credits from one Austrian University to another.

GRADUATE PROGRAMMES (*WISSENSCHAFTSKOLLEGS*) OFFERED BY THE AUSTRIAN SCIENCE FOUNDATION

While the above-mentioned examples display only slight variations in typical departmental regulations, some other examples of programmes developed in particular fields of research and teaching can be cited as examples of "prototypes" for enhanced Doctoral studies in Austria.

In 1994, the Austrian Science Fund (FWF) decided to establish special research areas (*Spezialforschungsbereiche*) as a reaction to the unsatisfactory situation of Doctoral studies in Austria. These programmes were modeled on the example of programmes established by grants from the *Deutsche Forschungsgemeinschaft (DFG)* in Germany. As in the German examples, the FWF intended to combine such special funding programmes with enhanced graduate training in the respective areas.

Based on the positive experience with about 200 *Graduiertenkollegs* in Germany, intensive interdisciplinary research training and high level study programmes in a particular scientific field should be made available to Doctoral students by teams of renowned scholars. A target group for this FWF subsidy consisted of highly qualified Doctoral students from Austria and abroad and scientists of any discipline who were working in Austrian universities or in other non-profit extra-university research departments. As a first step, funding for one *Wissenschaftskolleg* was promised in early 1994. Only a year later, in 1995, the FWF reviewed its policy and came to the conclusion that it would neither be possible nor desirable to establish graduate programmes at a comparable scope as those in Germany. This conclusion was based on the assessment that the FWF lacked sufficient resources for such an ambitious project.³¹ Second, the conclusion was reached that the FWF had neither the impact/power to change the organization of university education, nor was it the task of the FWF to strive for such changes.

As a consequence, the graduate programmes (*Wissenschaftskollegs*) of the FWF were established as extremely selective elite programmes. They are expected to evolve into centers for the training of first-rate young scientists. They will be established only in scientific areas in which the productivity in Austria is exceptionally high. A requirement is the constitution of a group of very highly qualified international scientists who work together (and generally in trans-disciplinary teams) within a thematically defined framework and who wish to train young scientists up to the highest level. Another requirement is the availability of

³¹ As a result of this policy review, the FWF decided to establish graduate programmes only as elite programmes in a very strict sense.

infrastructure (space, laboratories, and equipment) for high-quality scientific work. Finally, there must be a guarantee that training within the *Wissenschaftskolleg* will be accepted for the award of Doctoral degrees.

In seven years, only three (!) such programmes have been funded. One reason for this low figure is that very few institutions and researchers apply, owing to the high rate of rejection which makes application a very risky investment. The FWF has again started to review its policy on Graduate Programmes. A new policy is expected to be developed in spring 2004.

CASE STUDY: *GRADUIERTENKOLLEG HISTORISCHE ANTHROPOLOGIE* [GRADUATE COLLEGE IN HISTORICAL ANTHROPOLOGY]

A pilot group working on the creation of new programmes within the new framework of the FWF was the Historical Anthropology Project Team in the Department of Space and Economy of the Institute of Interdisciplinary Research and Continuing Education (IFF) based in Vienna. The team was charged with setting up an interdisciplinary historical anthropological organization of Doctoral studies: the *Graduiertenkolleg Historische Anthropologie*. Just as the programme was initiated, the FWF cancelled the funding owing to its new policy.

- It seems symptomatic for Austrian politics that the FWF interrupted the *Wissenschaftskolleg programme* one year after its advertisement. Therefore, the application for a *Wissenschaftskolleg Historische Anthropologie* which had been elaborated by the project team at the IFF could not be successful. Nevertheless, a pilot phase for a *Graduiertenkolleg Historische Anthropologie* was launched by the IFF in Vienna, running from October 1996 to June 1998. [...] The pilot phase was a low-budget-project, the financial resources had been mainly derived from the IFF's own sources. So it was impossible to supply the participants in the *Kolleg* - the Doctoral students - with grants. Therefore, the responsible persons at the *Kolleg* decided not to run an extensive system of selection. Every candidate merely had to compose an abstract of [a] dissertation project in the field of historical anthropology. Twenty students were admitted and took part. They were representatives of several social, cultural, and human sciences: History, European Ethnology, Chinese Studies, Sociology, Psychology, Roman Philology, and Theology (Pellert and Dressel, 1998).

In contrast to the general situation of Doctoral students in Austrian universities, the Doctoral students at the *Graduiertenkolleg Historische Anthropologie*

... were integrated in a network of communication and discussions based on several kinds of seminars within the *Kolleg*. Installing a *curriculum* of seminars is a prerequisite for extensive

discussions about several approaches by several disciplines within... historical anthropology (Pellert and Dressel, 1998).

The central course at the *Kolleg* was the so-called *Kollegforum*:

In contrast to other seminars at the *Kolleg*, it [the *Kollegforum*] was held in consecutive terms. In the forum, the participants talked about the relationship between sciences, society, and life history. There was, however, another basic principle at the *Kollegforum*: the principle of self-organisation (Pellert and Dressel, 1998).

Innovations were also introduced in the area of mandatory coursework towards a more “socially-related and reflective approach”:

In each course of the *Graduierntenkolleg*, the social background of historical anthropology has been reflected on, especially in the method of life history: Seminars where the thematic fields of historical anthropology were discussed also included one task for all participants: trying to join thematical interests (gender, family, sex, etc.) with experiences of one’s own life. In seminars where historical anthropological methods were discussed, similar questions have been set (Pellert and Dressel, 1998).

These seminars were complemented by a series of lectures in which representatives of several social, cultural, and human sciences reflected on this interrelation. An additional field trip to South East Europe, in combination with a seminar, gathered Austrian and Bulgarian anthropology students in Bansko (Bulgaria).

To some extent, the pilot phase of the “*Graduierntenkolleg Historische Anthropologie*” was successful:

Although the participants did not get grants, even though they had to raise money and [hold] jobs beside writing their dissertations and being a member of the *Kolleg*, fifteen Doctorate students completed the mandatory programme of events and seminars. In their view it seems important to leave the isolation during working on the dissertation and to become a part of historical anthropological communication structures. [...] Now, some of the former members are integrated in research projects within the Department of Space and Economy at the IFF. Other participants formed a project team for elaborating a common historical anthropological investigation in the context of the Austrian Ministry of Science’s present focus on Cultural Studies (Bellert and Dressel, 1998).

On the other hand, the project was not able to fulfill some of the earlier expectations during the pilot phase:

First, too few participants had finished their dissertations after the four terms. Second, the Doctorate students were not able to get

sufficient experience for organizing their own projects in [the] future (Pellert and Dressel, 1998).

THE PROFESSIONAL DOCTORATE

In recent years, Austrians have observed the growing popularity of programmes leading to professional degrees at Anglo-American universities. Austrian institutions of higher education do not officially recognize such kinds of degrees. Nevertheless, some existing programmes show traces of a professional degree:

Above all, the Master's degree programmes at Austrian polytechnics (*Fachhochschulen, FH*) leading to a specially indicated Master's degree, the *Mag. (FH)*, have a declared emphasis on the practical application of sciences. Another proof of existing professional degrees is the introduction of postgraduate Master of Business Administration (MBA) degrees that are offered by some Austrian universities. Also, the Doctorate in Medicine, that is not necessarily a research Doctorate, may be viewed as a professional degree, for it includes a strong component of (clinical) practice in the second phase of studies.

The *Doktorandenkolleg Organisationsentwicklung* at the IFF is a professional programme at Doctoral level and might be considered as a pilot project intended to establish a professional Doctorate. Although it is a research Doctorate, according to the general regulations prevailing in Austria, the programme is, more than others, tailored to the needs of professional adults, both in terms of organization (teaching in blocks) and of content (students are encouraged to conduct research on projects focused on their daily practice). The programme is peculiar in that it admits only students who already have professional experience. Students who want to enroll immediately after the award of their Master's degree are not accepted. The reason is that the Doctoral programme is organized as a theoretical reflection of professional experience. Students not having this experience simply cannot participate.

BIBLIOGRAPHICAL REFERENCES

- "Bundesgesetz über die Organisation der Universitäten und ihre Studien, Universitätsgesetz 2002", in, *BGBI* 1 120 (2002) <<http://www.bmbwk.gv.at/start.asp?isllink=1&bereich=7&l1=1101&l2=1108&l3=4257&OID=7724#>> (17 November 2003).
- "Bundesgesetz über die Studien an den Universitäten (Universitätsgesetz - UniStG) 1997" [with several alterations up to 2002] <<http://www.bmbwk.gv.at/start.asp?isllink=1&bereich=7&l1=1101&l2=1108&l3=4257&OID=4296#>> (17 November 2003).
- BUNDESMINISTERIUM FÜR BILDUNG, WISSENSCHAFT UND KULTUR. (BMBWK). Hochschulbericht 2002. 2 Bände. Vienna: Bundesministerium für Bildung, Wissenschaft und Kultur, 2002. [Band 1: <<http://www.bmbwk.gv.at/>

- medien/8330_hb_2002_bd1.pdf>; Band 2: <http://www.bmbwk.gv.at/medien/8331_hb_2002_bd2.pdf>] (17 November 2003)].
- GELLERT, Claudius. "The Conditions of Research Training in Contemporary German Universities", in, Burton R. CLARK, ed. *The Research Foundations of Graduate Education: Germany, Britain, France, United States, Japan*. Berkeley and Oxford: University of California Press, 1993.
- PELLERT, Ada, and DRESSEL, Gert. "Historical Anthropology": Innovation in Central European Postgraduate Research and Doctoral Training, Vienna: IFF, 1998 (Internal paper).
- SCHRATZ, Michael. "Das Doktoratsstudium in Österreich: Der vernachlässigte 'dritte Studienabschnitt' [Doctoral Studies in Austria: The neglected "third academic circle"]", in, *Zeitschrift für Hochschuldidaktik (ZSHD)*. 18 2 (1994): 207-219.
- "*Studienplan des Doktoratsstudiums der Philosophie an der Geistes- und Kulturwissenschaftlichen Fakultät der Universität Wien*". <http://www.univie.ac.at/Geschichte-Meta/studium/s_sp_dokt.htm> (17 November 2003).
- Universitäts-Studiengesetz*. "UniStG. Bundesgesetz über die Studien an den Universitäten (Universitäts-Studiengesetz - UniStG)", in, *BGBI. I 48* (1997) zuletzt geändert durch *BGBI. I 121* (2002) <<http://www.bmbwk.gv.at/start.asp?isllink=1&bereich=7&l1=1101&l2=1108&l3=4257&OID=4296#>> (17 November 2003); <<http://www.bmbwk.gv.at/start.asp?bereich=7&OID=5793&l1=6367&l2=6370&l3=6380>> (20 November 2003).
- UNIVERSITY OF VIENNA, STUDENT POINT. "Doctoral Programmes - General Information" <http://www.univie.ac.at/studentpoint/artikel.php?Alias_ID=364&Sprach_ID=2&Art_ID=400> (17 November 2003).
- "Verordnung der Bundesministerin für Bildung, Wissenschaft, und Kultur über das Doktoratsstudium für Absolventinnen und Absolventen von Fachhochschul-Studien-gängen wirtschaftlicher Richtung", in, *Bundesgesetzblatt für die Republik Österreich*. Jahrgang 2002, Teil II, ausgegeben am 14. Juni 2002. <http://www.mci.at/fh/pdf/vo_doktorat_wirt.pdf> (17 November 2003).

II. France

JEAN LEMERLE

1. INTRODUCTION

The decrees and regulations that govern the organization of studies in higher education in France were modified in April 2002. They take into account the implementation of the criteria of the European Higher Education Area (the Bologna Declaration) in the French higher education system. In comparison with the former regulations, the changes affecting the Doctoral degree are minor. For other qualifications, temporary regulations allow a progressive implementation of the new regulations by the universities.

For different areas of training, degrees and titles mark the different common levels of higher education in France (see Table 1 below). The main levels in the European higher education area are only marked by the respective degrees. In France, academic titles are used to mark the intermediary levels.

Table 1. Diplomas, academic titles, and degrees in France

Diploma	Credits (ECTS) for the diploma (numbers)	Academic title	Degree	Credits for the degree (numbers)
<i>Diplôme d'études universitaires générales</i> (DEUG)				
<i>Licence</i>			<i>Licence</i> (Bachelor's degree)	180
<i>Maitrise</i>	60	<i>Maitrise</i>		
<i>Diplôme d'études supérieures spécialisées</i> (DESS)	60		Master's degree	300
Vocational master			Master's degree	300
<i>Diplôme d'études approfondies</i> DEA	60		Master's degree	300
<i>Master recherche</i>			Master's degree	300
		Graduate engineer*	Master's degree	
<i>Doctorat</i>			Doctorate	
<i>Habilitation à diriger les recherches</i> (HDR)				

* Vocational title awarded by state or private institutions of higher education that are authorized by a national committee, Committee of Engineers' Titles.

Source: The author.

State diplomas are awarded by authority of the State following an examination or a continuous evaluation. They mark each step in training programmes. The name of the institution having issued the diploma must be stated on the certificate. The field of training represented by a diploma must be indicated in the title of the diploma. Only State diplomas can be awarded for the *licence* (Bachelor's degree), the *master*, and the Doctorate. Whatever the institution that awards a State diploma, such a diploma confers identical rights. For example, a student who earns a *licence* in mathematics in a university in Paris has the same rights as another student who earns a *licence* in mathematics in another university in the country.

The degrees and titles are awarded when the corresponding state diplomas of higher education are awarded. So, the state Doctoral Diploma is awarded by a university when the evaluation of the results obtained during the preparation of the thesis is positive. A Doctoral degree is awarded to a student who has earned the state Doctoral diploma.

All French universities (the universities in France are all State universities) and the *écoles normales supérieures* (university-level colleges that prepare students for senior posts in teaching and other professions) are eligible to award the Doctoral degree. The ministers who are in charge of higher education and research can authorize other State higher education institutions to award the Doctoral degree. These institutions can be authorized to do so alone or jointly with other institutions. In the latter case, an agreement specifies the modes of co-operation among institutions that award the Doctorate.

Preparation for the Doctorate is organized in "Doctoral schools". These schools are mainly found in institutions that are eligible to award the Doctoral degree and must be authorized by the ministers in charge of higher education and research. Other institutions that are eligible to award the Doctoral degree (alone or jointly with others) can be members of these Doctoral schools. Higher education institutions that are not eligible to award the Doctoral degree may function as Doctoral school partners offering training courses or receiving Doctoral students in their laboratories in order for them to undertake research activities necessary for Doctoral studies.

2. QUANTITATIVE TRENDS

For the year 2000, the number of Doctoral degrees awarded in France was 39 percent higher than in 1990. The rate of increase was not the same for all branches of learning and research.

Table 2. Numbers of Doctoral degrees awarded in 1990, 1998, and 2000

Year	Law and Political Science	Economics	Humanities	Sciences	Physical Education	Total	Increase/1990 = 100 percent
1990	521	411	1,513	4,705	11	7,161	0
1998	678	493	2,175	6,204	26	9,576	34
2000	961	643	2,593	5,699	30	9,926	39

Source: The author.

Table 3. Numbers of Doctoral degrees awarded in medical branches, in 1993, 1998, and 2000

Year	Medical sciences	Pharmacology	Odontology	Total
1993	282	215	15	512
1998	426	157	14	597
2000	272	214	12	504

Source: Statistics of the Department of Education and the Department of Research (1995-2001).

The numbers of Doctoral degrees awarded in scientific research increased from 1990 to 1998 (32 percent) and decreased from 1998 to 2000 (8 percent). On the other hand, the numbers of Doctoral degrees awarded in other branches of research continuously increased (58 percent). In France, the sciences are not as attractive to students as other branches of learning. So, the numbers of students in scientific branches are continuously decreasing, a trend confirmed with reference to Doctoral studies. Nevertheless, 57 percent of the Doctoral degrees awarded are scientific degrees.

Information on the numbers of Doctoral degrees awarded by a given university serves the Government in determining the level of State involvement in the university activity. In France, the average numbers of awarded Doctoral degrees are 0.21 per academic staff member and 0.13 per researcher in a national research institution.

In 1998, 40 percent of the Doctorates were awarded to women, but this ratio depends on the speciality and the nationality of Doctoral students. This ratio increased by 8 percent over the past seven years. In the case of foreign Doctoral candidates, the proportion of women (30.5 percent) is lower than among French candidates (43.5 percent). The numbers of women among Doctorate holders in Mathematics, Computer Sciences, Physics, and Engineering are very low.

Table 4. Numbers of Doctoral degrees awarded to women in 1998 in the academic disciplines of Sciences and Humanities (in percentages)

	Sciences					Humanities	Total
	Mathematics Computer Sciences	Physics Engineering	Earth Sciences	Chemistry	Biology		
Women	29.5	25.6	38.2	47.2	53.7	50.4	40.3

Source: The author.

The median age of students when receiving their Doctoral degrees is 31.5 years. Generally, the median age is lower for women (29 years) and higher for foreign students (31.9 years). The youngest persons with newly awarded Doctorates are found in some of the hard sciences like Physics or Chemistry (median age 27.8 years).

Some 50 percent of the holders of a *DEA*¹ will go on to earn a Doctorate. This proportion has increased since 1996. Among the holders of a *DEA* in the fields of Earth Sciences and Sciences of the Universe, the ratio of Doctoral students (65 percent) is higher than in other branches of learning.

Over the year 2000, 25 percent of the Doctoral degrees were awarded to foreign students. The proportion had declined (roughly by 5 percent from 1992 to 1998). This trend is continuing. The proportion of foreign students is increasing slightly in the case of European students; strongly, in the case of students coming from Central Europe. The numbers of students coming from North Africa are becoming less significant. Few Doctoral students return to their countries of origin after graduation (30 percent). Among the students who do return, half of them obtain employment in higher education.

3. AWARD OF DOCTORAL DEGREES AND QUALIFICATIONS

Organization of Doctoral Studies

French higher education is organized in three cycles. State diplomas are awarded at the end of each cycle.

The *licence*² degree is awarded to the bearers of a State *licence* diploma. The examination corresponding to this diploma is organized during the second cycle of university studies, but the corresponding training lasts for three years (two years during the first cycle and one year during the second cycle). The Master's degree is released to the holders of a State diploma released after the successful completion of a five-year course of study. The examination is organized during the university third cycle, but the corresponding training lasts two years (one year during the university second cycle and one year during the university third cycle).

The Doctoral degree is awarded at the end of the university third cycle; however, the training is only organized during the third cycle.

The Doctoral degree is granted to bearers of a State Doctoral Diploma. Legal regulations define admission requirements and procedures, the organization of studies, examination requirements, and evaluation and confirmation of the degree.

The institutions eligible to offer Doctoral studies may propose a specific organization of studies to the minister in charge of higher education and research. This proposal is made during the negotiations

¹ *DEA* - *Diplôme d'études approfondies*, academic title awarded by a university after a five-year course of study (including the *licence*) as preliminary to a Doctorate.

² *Licence* - first degree of higher education in France that is equivalent to the Bachelor's degree.

for the institutional contract³ and must be compatible with legal regulations. The practical academic regulations regarding the organization of Doctoral studies depend only on the will of the given institution.

The training of Doctoral students takes place in Doctoral schools. Each Doctoral school has its own scientific training project that must be compatible with university policy as defined in the university strategic plan. Any laboratories that are part of a Doctoral school have a great interest in the scientific project of the school. Evaluation of such laboratories by a national committee is necessary prior to their inclusion in the Doctoral school.

The Doctoral schools organize training courses for third cycle diplomas (five-year study courses) corresponding to the Master's degree. These include the *Diplôme d'études approfondies* – DEA, the *Diplôme d'études supérieures spécialisées* – DESS,⁴ and the *Master recherche*.⁵ Some training courses are also organized for Doctoral students. The Doctoral schools offer:

- scientific management and training in research laboratories;
- training for Doctoral students to undertake scientific and professional projects;
- international relationships.

Doctoral schools may organize annual seminars to improve the employability of their students. These seminars, called *doctoriales*, are run in co-operation with industry. Complementary courses (*Formation complémentaire*) in foreign languages, economics, etc., are also offered with a view to preparing students for employment.

Each Doctoral school has a consultative committee and is managed by a director who is appointed by the president of the university. The director must have the *Habilitation à diriger les recherches*.⁶ The director of the Doctoral school advises the president of the university on all matters that concern the admission of students to Master's degree or to Doctoral studies. Grants or salaries for Doctoral students are proposed by the director.

While preparing their Doctoral degrees, Doctoral students take courses and seminars and undergo training, all of which is organized by

³ Within the context of the contractual policy of the Government, a four-year institutional contract can be signed between each higher education institution and the Ministry in charge of higher education.

⁴ DESS – *Diplôme d'études supérieures spécialisées*: university degree awarded after a five-year course of study including vocational training.

⁵ *Master recherché* – second degree of higher education preliminary to a Doctorate (five-year study course). Since 1999, it is also awarded to holders of a DEA.

⁶ The *Habilitation à diriger les recherches* is a diploma that is awarded by the universities or the institutions authorized by the minister in charge of higher education. It recognizes a scientific high level and an ability to manage young researchers. It is indispensable for appointment as a professor in a university.

the given Doctoral school. Students are admitted to a research team or a laboratory. Doctoral students undertake research under the supervision of a thesis director. The normal duration for the preparation of a Doctoral degree is three years. Exceptionally, the time limit can be extended by the president of the university if approved by the thesis director. If a Doctoral student is gainfully employed in work that is different from the research being undertaken, the duration of his or her preparation for the Doctoral degree is six years.

A thesis director must be a professor or a researcher, holder of the *Habilitation à diriger les recherches* or a high level personality, proposed by the director of the Doctoral school and appointed by the president of the given university.

Doctoral schools have been in existence since 1998. They are very useful for structuring research activities in universities and are very important in the negotiation of a university's institutional strategic plans. There are more than three-hundred Doctoral schools in France.

Some theses can be prepared under the joint supervision of two institutions. One must be a French university, and the other can be a foreign university. An agreement defines the procedures for the admission of Doctoral students in such circumstances, the duration of the preparation in each institution, the language in which the thesis is to be written, as well as the procedures for the evaluation, the final defense, and the confirmation of the degree by the two institutions. The principle of reciprocity is applied in such cases.

Table 5. The path through Doctoral studies in France

	Requirements	Proposal	Advice	Decision
<i>Preparation for the Doctoral degree:</i>				
Admission	DEA or <i>Master recherche</i> or the equivalent	Director of the Doctoral school	Director of the thesis	President of the University
<i>Final defense:</i>				
Authorization	Opinion of the <i>rapporteurs</i>	Director of thesis	Director of the Doctoral school	President
-----	-----	-----	-----	-----
Appointment of the panel			Thesis Director	
-----	-----	-----	-----	-----
Award	Favourable evaluation		Director of the Doctoral school	President
-----	-----	-----	-----	-----
Diploma signatures		Jury		President

Source: The author.

Quality of Doctoral Studies

Doctoral schools are recognized by the ministers in charge of higher education and research for the duration of the institutional contract (four years). Doctoral schools can also be recognized even if the university in question does not have an institutional contract, but the duration cannot exceed four years. The evaluation of the organization of a Doctoral school and the evaluation of the results obtained during the previous four years are made prior to the negotiation of a new contract (or the initial recognition of a Doctoral school). Over the same period, the research teams of the given Doctoral school are evaluated by a national committee. The coherence of the scientific project, the quality of the research teams of the Doctoral school, and the graduates' insertion into the labour force market are the determining factors in the school authorization decision made by the minister.

4. ADMISSION TO DOCTORAL STUDIES

Candidates need the approval of the given university president (or the head of the higher education institution) to enroll in a Doctoral study programme. The director of the Doctoral school makes his or her recommendations on the students wishing to enroll, and the thesis directors express their opinions. Doctoral students must enroll or re-enroll at their universities each year. Each student must sign a Thesis Charter when he or she registers for the first time. The Thesis Charter is a contract between the partners of a thesis: the Doctoral student, the thesis director, the director of the laboratory, and the director of the Doctoral school. It defines the responsibilities of each partner in order to facilitate the course of Doctoral studies. The thesis director gives his or her opinion, and the director of the Doctoral school proposes the subject of the thesis that is approved by the president of the university in question.

Students must be holders of a *DEA* or of a *Master recherche* to be allowed to seek registration at a university. Exceptionally, so far as this rule is concerned, the president of the given university can authorize a student, not holding these State diplomas, to register. Such is the case of the holders of a Master's degree corresponding to an engineer's title⁷ or a vocational *Master* or of students who have been awarded qualifications in foreign countries. Particular criteria are also applicable to students who benefit from validation of knowledge acquired in non-formal contexts (*validation des acquis de l'expérience*). Currently, credit systems (ECTS) are generally not used for the *Master*. They will be introduced progressively, with the implementation of the Bologna Process, by the universities. Most of the universities have put forth plans for credit systems in their institutional projects and contracts.

⁷ Vocational title awarded by state or private higher education institutions that are authorized to do so by a national committee, the "Committee of Engineers' Titles".

In the case of a candidate who is not the holder of a *Master recherche* (or a *DEA*), any exceptions to the standard admission rules can only be made by the president. Each student must prepare a detailed proposal concerning the nature of his or her studies, the *curriculum*, and his or her qualifications. In authorizing the registration of a candidate at a given university, its president can request that a committee (academic board) offer an opinion. The members of this committee are appointed by the president who decides how it must work. Generally, this committee compares the level of previous *curriculum* and studies of the candidate to the level and *curriculum* of the *Master recherche* given by the university. If they are judged to be equivalent and if the results of the student are satisfactory, the committee forwards its approval to the president. In some cases, the committee may hold an interview with the candidate.

The *validation des acquis de l'expérience* is defined by law. It corresponds to the experience that is acquired in a professional activity over at least three years. This experience can be recognized by a panel. Such a panel is appointed by the president of the university. Some of the members of the panel must be university staff members, and some must be professional or company staff members. The panel reaches a decision on the validation of knowledge and eventually proposes complementary training or examinations. A *Master recherche* can be obtained through these procedures, and the admission of the concerned candidates to Doctoral studies can be authorized.

Evaluation Procedures

Each Doctoral student must personally write and defend a thesis even if collective work is involved. In the case of collective work, each dissertation must provide for an estimate of the personal contribution of each candidate. Each thesis must be submitted to two *rapporteurs*. These *rapporteurs* must be professors in a university or hold the *Habilitation à diriger les recherches* or an equivalent scientific qualification. They can come from foreign institutions. The *rapporteurs* deliver their opinions in written reports to the president of the university. These reports and the recommendation of the director of the Doctoral school are taken into account by the president who authorizes the final thesis defense. This defense is open to the public (with rare exceptions, if the subject is confidential). An abstract is disseminated in the university before the defense, and the whole thesis is published after the defense.

The panel (three to six members) is appointed by the president on the advice of the thesis director and the director of the Doctoral school. The thesis director is a member of the panel but cannot be a *rapporteur* or the president of the panel. One-third of the members must have institutional affiliations other than that of the given Doctoral school or university. Half of the members of the panel must be professors in a university. High-level personalities from foreign institutions can be members of the panel. The panel expresses an opinion on the scientific

work of the candidate, on his or her ability to place his or her results in scientific context, and on his or her general skills in making the presentation. After deliberation, the panel designates an award for the candidate. The president of the panel writes a report about the defense. The report indicates whether or not the Doctorate is to be awarded with distinction. This report is given to the candidate. The certificates (the Doctoral diploma and degree) are signed by the president of the university.

The Status of Doctoral Students

While engaged in Doctoral studies, Doctoral students must be registered at a university. The registration confers student status and social security benefits. For students with no income, the social security cover (*sécurité sociale étudiante*) is inexpensive. In order to obtain support, Doctoral students have several possibilities for the funding of their theses: grants, employment related to the research project, etc.

Each year, the French government (i.e., the department in charge of research) allocates 4,000 research stipends to Doctoral students designated by the universities. The selection procedures are defined by the committees of the Doctoral schools. The students are chosen by the directors of the Doctoral schools. In assigning these stipends, priority is given to French students, European students, or foreign students who have studied in French universities.

Stipends are often referred to as grants, but they are, in fact, salaries. There is a great difference between a grant and a salary. When a student has a grant, his or her social security cover is the *sécurité sociale étudiante*. It is a low-cost basic contribution. If a student has a salary, his or her national insurance contribution is proportional to the salary and is, therefore, more expensive than the *sécurité sociale étudiante*. Also, a salary is subject to income tax.

The research allowance is a salary that is paid by the Government. It corresponds to a fixed term employment contract running for three years. During these three years, the Doctoral student must work full time to prepare a Doctoral degree in a research laboratory. The salary is €1,190 per month. Half of the Doctoral students who receive research stipends can sign an additional contract to undertake a training activity with undergraduate students (64 hours per year) as a counterpart to a salary increase (€335 per month).

During the final year of preparation of a Doctoral degree, a Doctoral student can sign a fixed-term teacher's contract in a university. According to such a contract, the Doctoral student must teach undergraduate student classes for 192 hours per year or supervise laboratory work for 298 hours per year, while undertaking research activity in the university laboratory for the rest of the time. The corresponding salary is €1,911 per month.

Local communities, national research institutions, and enterprises can also allot research allowances independently or jointly. These allowances are often reserved to engineers or to students who have a vocational Master's degree.

A Doctoral student can also sign a fixed-term employment contract for the duration of his or her Doctoral studies (three years). The employment corresponds to the work that he or she is undertaking in the laboratory during the preparation of his or her thesis. In general, these fixed-term contracts correspond to co-operative projects of applied research contracted between the university and an enterprise. The corresponding remuneration (from €1,400 to €2,000 per month) is provided either by the enterprise in question or by the university, according to the contract signed between the two of them. Many laboratories are under the joint supervision of a university and a research institution. Such fixed-term contracts can also be signed by research institutions in order to remunerate Doctoral students.

Foreign students can obtain grants from their own governments or from the French government. In the latter case, the grants are awarded by the French Embassies in foreign countries. Doctoral students can also hold employment that is not related to the preparation of a thesis. In such conditions, they do not work full-time in the laboratory, and the duration of their Doctoral studies is extended to six years. Such is the case of teachers in secondary schools who undertake Doctoral studies.

Some 85 to 95 percent of Doctoral students in the sciences receive funding during their Doctoral studies. Only 40 percent of the other Doctoral students have funding. For Doctoral students in the sciences, the research allowances paid by the Government (the Department in charge of Research) represent 30 percent of the funding. The remaining funding comes from firms or research institutions. In Law and Political Science, the funding for Doctoral students comes only from research allowances provided by the Government. In the Humanities, one-third of the funding for Doctoral students comes from allowances paid by the Government. The remaining two-thirds come from payments made by teachers in secondary schools, payments that are not related to Doctoral studies.

Table 6. The funding of Doctoral students (in percentages)

Funding	Doctoral degrees awarded in 1998	Doctoral degrees begun in 1998
Research allowances (Department of Research)	27.5	29.0
Other funding related to Doctoral studies	10.2	14.2
Salaries not related to Doctoral studies	35.7	32.8
No funding	26.6	24.0
Total	100.0	100.0

Source: The author.

Problems Faced by Doctoral Students

The major problems confronting Doctoral students are related to the funding of their studies. Students in the Humanities have greater difficulties in this respect than those in the Sciences. In the fields of the Humanities, funding comes almost exclusively from the government (the Department of Research). It is for this reason that secondary school teachers represent such a high proportion of the total number of Doctoral students registered in the fields of the Humanities. These teachers have permanent (civil servant) employment or fixed-term contracts.

As the universities need to have Doctoral students in their laboratories, they must develop partnerships in order to obtain funding for them. The relationships developed between universities and firms are fundamental for increasing the funding of theses. In addition, if the relationships are good, the integration of the Doctorate holders into the job market is easier, and the evaluation of the laboratory will be higher. The vitality of the laboratories and the competition among universities are determining factors in the funding of Doctoral studies. If laboratories are able to offer student funding, they are more attractive and are able to choose the best students. As a consequence, laboratories that have good Doctoral students are favoured when negotiating contracts with firms and in obtaining funding for students. Scientific laboratories are favoured in terms of good relationships with firms.

The preparation of a thesis in a field of the Humanities is often abandoned because of difficulties in obtaining funding for Doctoral studies. In the Sciences, when the preparation of a thesis is interrupted, it is usually because the student has found better-remunerated employment.

Typically in the Sciences for 100 theses attempted, 88 will be completed with award of the Doctorate and 12 will be abandoned. In the Humanities, however, out of 100 attempts, there will be 51 successful completions and 49 abandonments.

A remaining question is that of the appropriate employment for a Doctorate degree-holder.

Table 7. Thesis abandonment (in percentages)

	Sciences	Humanities	Total
Awarded Doctorates	88	49	72
Thesis abandoned	12	51	28

Source: The author.

Advantages for Doctorate-Holders

The question is what is appropriate employment for a Doctorate-degree holder.

Table 8. Employment of 1998 Doctorate-degree holders (in percentages)

Research institutions	8
Higher education	26
Secondary schools	5
Permanent employment in private firms	23
Temporary employment in private firms	9
Post-Doctoral students	17
Other jobs	7
Unemployed	5
Total	100

Source: The author.

The situation in private firms is very different from that in the civil service. University staff members and researchers in research institutions are civil servants. The Doctorate (or an equivalent foreign qualification) is required for one to apply for a post. If students want to work in higher education or in a research institution, they must hold a Doctoral degree.

To students who wish to work in industry or in private firms, the Doctoral degree offers an advantage in obtaining a specific job (research and development). Nevertheless, a student who has prepared a Doctoral degree risks obtaining employment up to three years later than a student who takes a job immediately after the receipt of a Master's degree. Because of this delay, the salary of a Doctorate holder may always be smaller than that of a *Master*-holder. Under these conditions, the holder of a Doctorate only benefits from the possibility of being able to choose his or her employment, to be in the managerial staff of a firm, and to have a better quality of life.

In the fields of the Humanities, the holder of a Doctorate will have a higher salary because salaries are very small for such specialists who only hold the *DEA*. When the economic situation is good, many students, holding a *Master*, prefer to go immediately into employment in a private firm and do not undertake Doctoral studies. When the economic situation is turning down, students prefer to enroll in Doctoral studies and to wait for economic recovery or to seek employment in a branch of the civil service that requires Doctorate holders.

Table 8. Employment of former Doctoral students, with or without an awarded degree (1998)

Doctorate	Unemployed (%)	Manager (%)	Median salary (€ per month)
Doctorate awarded in the Sciences	5.7	92.7	1,980
Doctorate awarded in the Humanities	12.5	86.7	1,910
Doctorate in the Sciences – not awarded*	1.7	84.9	2,060
Doctorate in the Humanities – not awarded*	6.6	67.5	1,580
Total	7.0	85.9	1,910

*The proportion of students who failed to have their Doctorates awarded corresponds to the sum of students who stopped their preparation of a thesis and of those who stopped studying after having been awarded the *DEA*.

Source: The author.

Post-Doctoral Studies and Employment

University staff members and researchers in national research institutions are recruited by competition. The competition takes place once a year. To apply for a post, a candidate must hold a Doctorate. The recruitment procedure is a long one (several months). So, Doctorate holders who wish to work in universities or in research institutions must have temporary employment while waiting for the results of the recruitment procedure. Generally, they will choose employment in a field of research to upgrade their *curricula vitae*. Post-Doctoral studies are also taken into account by the recruitment panels if the post-Doctoral study period has not been spent in the same laboratory as the one in which the thesis was prepared. So, newly awarded holders of Doctorates are encouraged to look for post-Doctoral employment in foreign laboratories or in laboratories that do not belong to the university having awarded their degrees. Different kinds of funding are available for post-Doctoral studies. The main source of funding for post-Doctoral studies comes from European Union programmes. The financial resources of laboratories can be used to recruit post-Doctoral students who can work in co-operative applied research projects. Fixed term contracts (generally twelve to eighteen months) are signed. Recently, the French research institutions (CNRS and INSERM) have been authorized by the Department of Research to recruit post-Doctoral students (400 per year). The corresponding remuneration is €2,150 per month. Mobility (the Doctorate holder must move to a different laboratory) is the single condition enabling eligibility for the funding of post-Doctoral studies under this scheme.

5. RECOGNITION OF FOREIGN QUALIFICATIONS

The procedures for obtaining recognition of foreign qualifications vary, according to the institution in which the student wishes to study and the qualification he or she is seeking to have recognized. In all cases, the candidate needs to prepare an application dossier which should include a copy of his or her qualifications (in the original language and in French translation) plus a detailed account of his or her academic record. The fuller and more detailed the descriptions of units are, including the number of hours per unit, the better the chances of success. In general, in order to obtain recognition of a foreign qualification as equivalent to a *Master*, the experts making up the academic boards will interview and test candidates.

The citation index of scientific papers derived from the thesis and the reputation of the university awarding the degree have a great impact on the evaluation of a Doctoral degree. If the thesis is prepared under the joint supervision of two institutions belonging to two different countries, the agreement that defines the supervision procedures guarantees the recognition of the degree by the two countries.

6. NOTE ON THE DATA PRESENTED IN THE TEXT AND IN THE TABLES

The statistics about theses were obtained from the specialized services of the French Department of Research. They were derived from the administrative databases of the universities that are eligible to award the Doctoral degree. The latest data were published in 2002 and concerned the year 2000. Other data, published by the French Department of Research, are available on the Internet. These data correspond to the results of a questionnaire survey distributed in the laboratories of Doctoral schools and can count the same thesis several times. So these data yield higher figures than what is really the case.

The statistics about the employment of Doctorate holders and the funding of theses were obtained from a questionnaire survey (1998 data) made before the establishment of Doctoral schools. A special study of these data was made for the Research Department by the *Centre d'études et de recherche sur les qualifications* (CEREQ) and by the *Laboratoire d'économie et de sociologie du travail* (UMR CNRS 6123). They are the latest data known for all the universities in France. Recent partial results confirm the trends indicated.

REFERENCES

Étude sur la mobilité des jeunes docteurs. Paris: CEREQ et UMR-CNRS 6123, 2002.

French legal texts:

Arrêté du 25 04 2002 relatif aux études Doctorales.

Décret n° 2002-481 du 8/04/2002 relatif aux grades et titres universitaires et aux diplômes nationaux.

Décret n° 2002-482 du 8/04/2002 portant application au système français d'enseignement supérieur de la construction de l'espace européen de l'enseignement supérieur.

Décret n° 2002-590 du 24/04/2002 relatif à la validation des acquis de l'expérience.

Statistics of the Department of Education and the Department of Research (1995-2001).

III. Germany

KLAUS HÜFNER

1. INTRODUCTION

Under the German Constitution (*Grundgesetz*), the sixteen German States (*Länder*) have most of the responsibility for education. On the basis of laws on higher education adopted by the *Länder*, universities must enact detailed regulations (*Promotionsordnungen*) covering the requirements for the awarding of Doctorates. These requirements vary, not only from *Land* to *Land*, but also from university to university, and within each university, from one faculty to another.

These extremely decentralized regulations on education imply that neither the Federal nor the *Länder* bodies can take much responsibility for the administration of Doctoral studies. It is also clear that no nationwide planning takes place either to determine the number of candidates or the specialties to be offered.

At university level, no comprehensive programmes for graduate studies leading to a Doctorate exist. The Doctorate is generally achieved through individual study and research. The candidate must find a supervisor and negotiate the selection of a topic and the time necessary for its completion. In most cases, Doctoral studies are planned and implemented individually. Research in progress is normally, but not obligatorily, supervised and discussed in Doctoral seminars or colloquia.

For the award of a Doctorate, three requirements must be met:

- i. The completion of a Doctoral thesis*, which is the central element in the process of earning a Doctoral degree. This thesis must be a written presentation of independent academic research. It must offer original research findings and thus contribute to the present state of knowledge in the given field. The thesis is assessed, on completion, by the supervisor and a second examiner and must be accepted when the results range between “with highest distinction” and “satisfactory”.
- ii. An oral examination*, which follows acceptance of the thesis. The organization of the oral examination varies from faculty to faculty. Three different models of an oral examination, taken before a panel of professors, can be identified:
 - the traditional form (*Rigorosum*): an examination which covers the entire range of the given subject. As a rule, one main subject and two subsidiary subjects are covered without reference to the topic of the Doctoral thesis that is often determined in prior consultations with the examiners.

- the defense of the Doctoral thesis (*Disputation*), a form that is being increasingly used;
- a lecture delivered by the Doctoral candidate and followed by a discussion (*Kolloquium*). This form refers either to the thesis or to a subject that varies explicitly from the theme of the dissertation.

As of the early 1990s, the German Conference of Rectors and Presidents of Universities and Other Higher Education Institutions (*Hochschulrektoren-konferenz* – HRK) as well as the Science Council (*Wissenschaftsrat*), signaled severe problems related to the research-oriented training of Doctoral candidates. In 1992, HRK suggested the introduction of graduate studies that would incorporate the model of Graduate Colleges (*Graduiertenkollegs*), which have been set up, since 1990, at a number of universities in the form of thematically-oriented research groups and which have special admission criteria. In 1996, HRK published detailed recommendations on Doctoral studies. At the same time, the Science Council also published its recommendations concerning the restructuring and the promotion of the training of Doctoral candidates.

In November 2002, the Science Council observed that a need to reform the training of Doctoral candidates continues to exist. A few months later, in February 2003, HRK published its recommendations concerning the organization of Doctoral studies.

In what follows, the changes that occurred over the last seven years are described in detail. But first, it is necessary to introduce some statistical information.

2. A STATISTICAL OVERVIEW

The situation in 1995 was as follows: A total of 22,387 Doctoral degrees had been awarded, among them, awards to 1,486 foreign citizens (representing 6.64 percent of the total – see Table 1). The proportion of women among the German Doctorate holders stood at 31.89 percent, whereas among foreign citizens, the figure was 25.84 percent.

Table 1. Awarded Doctoral degrees in 1990, 1995, 1999, 2000, and 2001

Year	German citizens	Foreigners	Total	Foreigners (%)
1990 ¹	17,280	1,214	18,494	6.56
1995	20,901	1,486	22,387	6.64
1999	22,806	1,739	24,545	7.08
2000	23,854	1,926	25,780	7.47
2001	22,779	2,017	24,796	8.10

¹ Only the former Federal Republic of Germany (including West Berlin).

Sources: *Bundesministerium für Bildung und Wissenschaft* (June 2002), p. 216; for 2001: <<http://www.destatis.de/basis/d/bi/wiku/hochtab5.htm>>.

In 2000, a total of 25,780 Doctoral degrees was awarded. The percentage of foreign citizens being awarded the Doctorate increased to 7.47 percent

(for a more detailed overview of Doctoral awards by subject, cf. Table 2 below):

Table 2. Doctoral degrees awarded to foreign citizens in 1990, 1995, and 2000¹

Subject	1990	1995	2000
Agriculture	63 (19.0); 15.2	74 (21.6); 19.1	101 (20.8); 27.2
Architecture	5 (0.0); 21.7	12 (25.0); 26.7	11 (9.1); 19.0
Art	13 (53.8); 5.5	14 (50.0); 4.4	20 (65.0); 6.3
Economics	47 (8.5); 7.2	51 (15.7); 5.5	36 (22.2); 3.5
Education	11 (54.5); 5.4	9 (66.7); 3.9	29 (62.1); 9.8
Engineering	150 (6.7); 10.7	264 (10.6); 12.3	255 (13.7); 10.6
Geography and Geology	42 (23.8); 27.2	46 (17.4); 33.4	64 (29.7); 42.0
Languages and Cultural Studies	160 (35.0); 9.5	231 (32.9); 11.2	331 (40.2); 12.4
Law	49 (14.3); 5.7	55 (20.0); 5.0	74 (31.1); 4.5
Mathematics and Computer Science	42 (9.5); 9.8	49 (10.2); 7.5	86 (25.6); 8.9
Medicine ²	241 (27.8); 4.0	245 (34.7); 3.9	321 (40.5); 4.4
Natural Sciences	357 (24.6); 6.9	395 (27.1); 5.7	606 (34.0); 8.0
Social Sciences	145 (15.2); 7.7	173 (17.3); 6.9	181 (29.8); 5.6
All subjects	1,214 (23.1); 6.6	1,486 (25.9); 6.6	1,926 (32.4); 7.5

¹ In parentheses: percentage of awardees who were women. The last figures indicate the proportion of foreign citizens related to the total of awardees (in percentages).

² Not including Odontology.

Source: *Wissenschaftsrat* (15 November 2002), Table 3, pp. 102-107; author's calculations.

Of the 23,854 German awards, 8,228 went to women (34.5 percent). The corresponding percentage of women among the foreign citizens rose to 32.4 percent. The most recent figures for 2001 indicate a decline: a total of 24,796 Doctorates was awarded; the percentage of foreign citizens increased to 8.10 percent; and 8,752 awards went to women (35.3 percent). Looking at the overall development between 1997 and 2001, the total number of awarded Doctoral degrees remained relatively constant.

Table 3. Doctoral degrees awarded to German and foreign citizens by subjects in 1990, 1995, 1999, and 2000 (in thousands)

Year	Total	Of which, in						
		Languages, Cultural Studies, Sports	Law, Economics, Social Sciences	Mathematics, Sciences	Engineering	Medicine	Agriculture, Forestry	Arts
1990 ¹	18.5 (5.1)	1.7 (0.6)	1.9 (0.3)	5.2 (1.1)	1.4 (0.05)	7.5 (2.8)	0.5 (0.14)	0.2 (0.12)
1995	22.4 (7.0)	2.1 (0.9)	2.5 (0.6)	6.9 (1.8)	2.2 (0.14)	7.8 (3.3)	0.5 (0.15)	0.3 (0.19)
1999	24.5 (8.2)	2.3 (1.0)	3.1 (0.8)	7.4 (2.0)	2.3 (0.2)	8.6 (3.8)	0.5 (0.2)	0.3 (0.2)
2000	25.8 (8.9)	2.7 (1.2)	3.3 (0.9)	7.6 (2.0)	2.4 (0.2)	8.9 (4.1)	0.5 (0.2)	0.3 (0.2)

¹ Only in the former Federal Republic of Germany (including West Berlin).

² In parentheses: German and foreign awardees who were women.

Sources: For 1990-1999: Federal Ministry of Education (July 2001), pp. 104-105. For 2000: *Bundesministerium für Bildung und Wissenschaft* (June 2002), pp. 220-221. Table 3 offers a breakdown according to subject groupings. The numbers of graduates in Medicine (including Odontology) remained the highest, increasing from 7,500 to 8,900 (34.5 percent of all Doctorates awarded in 2000). The second largest group received awards in Mathematics and the Sciences with 29.5 percent of the total in 2000.

Table 4 offers a more detailed picture for 1990, 1995, and 2000, differentiated according to subjects. In parentheses, the absolute and relative numbers of women having received the Doctoral degree are given.

Except in Education, an increase in the share of women can be observed in all subjects. In 2000, the percentages in Art, Education, Languages and Cultural Studies, and Medicine were significantly above the overall average share of 34.5 percent.

Table 4. Doctoral degrees awarded in 1990, 1995, and 2000¹ (by subject)

Subject	1990	1995	2000
Agriculture	415 (97)	374 (104)	372 (112)
Architecture	23 (2)	45 (9)	58 (22)
Art	236 (117)	315 (188)	317 (190)
Economics	654 (91)	924 (171)	1,024 (226)
Education	205 (77)	231 (124)	295 (135)
Geography and Geology	419 (81)	428 (94)	512 (137)
Languages and Cultural Studies	1,690 (604)	2,064 (874)	2,674 (1,197)
Law	862 (140)	1,105 (274)	1,634 (491)
Mathematics and Computer Science	429 (39)	655 (97)	964 (190)
Medicine ²	5,993 (2,243)	6,281 (2,626)	7,331 (3,265)
Natural Sciences	5,177 (1,126)	6,926 (1,752)	7,607 (2,023)
Social Sciences	1,886 (315)	2,493 (586)	3,261 (934)
All subjects	18,494 (5,137)	22,387 (7,059)	25,780 (8,852)

¹ In parentheses: number and percentage of awardees who were women.

² Not including Odontology.

Source: *Wissenschaftsrat* (15 November 2002), Table 2, pp. 96-101.

Table 5. Average age of Doctoral awardees in 1990, 1995, and 2000

Subject	1990	1995	2000
Agriculture and Forestry	32.0	33.0	34.4
Architecture	44.4	38.6	38.9
Art	34.0	34.5	36.5
Economics	32.4	31.7	32.6
Education	37.8	39.1	41.0
Engineering	33.5	32.9	33.6
Geography	33.6	33.6	34.5
Geology	33.0	32.7	33.3
Informatics	32.1	31.8	31.5
Languages and Cultural Studies	34.7	34.9	36.1
Law	31.9	31.8	31.8
Mathematics	31.4	31.2	31.8
Medicine ¹	31.1	31.4	32.0
Natural Sciences	31.4	31.2	31.8
Social Sciences ²	32.7	32.2	32.7
All Subject Groups	31.9	32.0	32.7

¹ Without Odontology.

² Including Economics, Law, and Political Science.

Source: *Wissenschaftsrat, Empfehlungen zur Doktorandenausbildung* (15 November 2002), Table 1, p. 95.

Looking at the average age of awardees (*cf.* Table 5), one can observe that most of the awardees received their Doctorates when they were over 30 years old, an average age that increased over the 1990s and is rather high by international standards. This high average age can be partly explained by the usually excessive duration of Doctoral studies in

Germany. Based upon a study produced by the German Research Society (*Deutsche Forschungsgemeinschaft* – DFG), the following data are of interest: between 1988 and 1992, the average duration of Doctoral studies in Engineering was 5.3 years; in the Humanities and the Social Sciences, 4.75 years; and in Mathematics and the Natural Sciences, 4.0 years (HRK, 1996), pp. 6-7).

These data were compiled from among graduates working in Collaborative Research Centers (*Sonderforschungsbereiche*), in which the working conditions in Doctoral programmes are rather good. This fact implies that one can assume that the overall figures for the mean length of Doctoral studies for different subjects was higher than those given above.

In a September 2003 survey, the DFG reported an average duration of Doctoral studies of 4.1 years for DFG scholars and of 4.3 years for those receiving stipends from other sources (DFG, 2003, p. 4). In conclusion, DFG postulated that this increase from 3.8 to 4.1 years for DFG scholars over the last two years as well as the high average age of all awardees in Germany require that measures be taken to reduce the duration of Doctoral studies both in- and outside the *Graduiertenkollegs*.

Additionally, other factors influence the high average age of graduates, such as the late age at which young children enter compulsory schooling in Germany, the thirteen years of schooling in most of the *Länder* leading to graduation from secondary school (*Abitur*), the fact that about 20 to 30 percent of the students have completed vocational training before entering a university, and – last, but not least – the excessive duration of the study period for the first university degree.

One “proxy” published is the frequency of Doctorates (*Promotionsintensität*), i.e., the number of students who passed university *Diplom*, *Magister*, and state examinations three, four, and five years earlier (except in Education). Only in Medicine does the number of Doctorates awarded relate to the number of graduations occurring in the same year, since medical students usually write their Doctoral theses while they are studying. The frequency indicator, achieved in the year 2000, was 15.4 percent without the inclusion of Medicine and 21.4 percent, including it.

Variation is high between, but also within, subjects. The highest frequency of awarded Doctorates, at 80 percent, was in Medicine. In Mathematics and Sciences, more than one-third obtained a Doctorate. The frequency was especially high in Chemistry (69 percent), but also in Physics (42 percent) and Biology (44 percent). The frequency of awarded Doctorates in other large subjects was much lower: in Engineering: 12.8 percent; in Language Studies and the Humanities: 11.7 percent, and in Law, Economics, and the Social Sciences: 9.3 percent. However, among the subjects in the last two groups, large variations could be observed.

These considerable variations between and within the different subjects reflect different patterns of Doctoral studies that are by no means uniform. The different Doctorate cultures have evolved because the awarding of Doctorates is not only a basic requirement for a university career, but also for other careers on the labour market for highly qualified personnel.

It should be noted that there is no data available on the numbers of Doctoral candidates and the numbers of dropouts as an indicator of the efficiency of graduate studies in Germany. The reason for this lacuna is that Doctoral candidates do not have a registered status in most German universities. They are either enrolled as students or employed as teaching/research assistants at the university or employed elsewhere. The number of Doctoral candidates will remain unknown so long as a distinct status for them has not been introduced into all German universities, thus allowing the monitoring of registered Doctoral candidates.

In the meantime, only "guesstimates" are possible. In 2000, about 46,250 teaching/research assistants were employed for a limited period of three to five years – either full-time or part-time. Most of them would have been considered to be Doctoral candidates during this period. In 2001, 3,777 Doctoral candidates, who had been admitted to *Graduiertenkollegs*, received stipends from DFG. In addition, 2,449 Doctoral candidates were financing their studies from "elsewhere". In 2000, about 4,900 Doctoral candidates worked in non-university research institutions, such as the *Fraunhofer-Gesellschaft*, the *Helmholtz-Gemeinschaft Deutscher Forschungszentren*, and the *Max-Planck-Gesellschaft*.

Taken together, the overall figure is about 57,500 Doctoral candidates to which an unknown number, possibly 40,000 Doctoral candidates, must be added, persons who are financing their graduate studies independently – either in addition to employment or from "elsewhere". This crude calculation again demonstrates how important it is that all Doctoral candidates have a registered status at their universities. The only conclusion to be drawn from this calculation is that only about 10 percent of all German Doctoral candidates are presently enrolled in *Graduiertenkollegs*.

3. PROBLEMS IN DOCTORAL STUDIES

In 1996, HRK identified six major problems (*HRK*, 1996, pp. 9-10):

- i. Since no distinct status for Doctoral candidates exists, the beginning of Doctoral studies remains unclear, and transparency concerning the assignment of topics and the responsibility for supervision is not guaranteed.
- ii. Doctoral candidates "are at risk of overspecializing, especially in cases in which they are assigned a narrow marginal sub-domain in a large-scale project and have inadequate supervision".
- iii. In subject areas that require less or no third-party funding (e.g., in the Humanities and the Social Sciences), Doctoral candidates often work in isolation with inadequate supervision. As a result, academic dialogue is underdeveloped, and candidates often fail.
- iv. In many cases, traditional forms of supervision, such as colloquia and seminars for advanced students, are inadequate, because of their informal and loosely structured character and non-interdisciplinary approach.

- v. The range of services required of teaching/research assistants, who are at the same time Doctoral candidates, prolongs their Doctoral studies – most often beyond their periods of employment at their universities.
- vi. In periods of a bleak labour market, Doctoral candidates tend to secure their incomes by accumulating consecutive posts and grants, which, in turn, tends to reduce their chances on the labour market.

4. RECENT DEVELOPMENTS

The 1996 *HRK* recommendations were based on an analysis of the problems cited above and on the positive experience of the establishment of the Graduate Colleges (*Graduiererkollegs*) funded by the DFG. These Colleges have been set up since 1990 in universities, in the form of thematically-oriented research groups. Admitted Doctoral students are normally awarded grants. The existence of the framework of a systematic study programme not only offers a full concentration on the subject chosen, but also a permanent dialogue on research in progress, leading towards both shorter study periods and better results. The candidates work under the supervision of one or more lecturers who are involved in the interdisciplinary research and study programme of the given *Graduiererkolleg*. They also attend required core courses and subject-specific courses (four to six hours every semester-week).

In conclusion, *HRK* stressed that graduates trained in *Graduiererkollegs* tend to be more broad-minded and better skilled at teamwork than other graduates and to display an affinity for interdisciplinary work, to have well-developed communication skills, and to achieve above-average results within an average period of 3.9 years (*HRK*, 1996, p. 12). Thus, the *Graduiererkolleg* should serve as a model for the elimination of the existing structural weaknesses “which have already impaired the international position of German universities in the worldwide competition for young academics and scientists” (*HRK*, 1996, p. 16).

In addition, *HRK* referred to the fact that Doctoral training all over the world is being organized in such a way that international compatibility is guaranteed, the system of graduate education of the United States serving as a model of internationalization.

HRK recommended that all Doctoral candidates be given an official status. Doing so would establish institutional responsibility for Doctoral training. *HRK* further recommended the introduction of Centers for Doctoral Programmes (*Doktorandenkollegs*) at universities to be modeled on the *Graduiererkollegs* and outlined different options for models ranging from the setting up of a center within a single faculty at a university to one center covering several departments at different universities (inter-university centers). The selection of students and their admission to Doctoral studies at a center should be decided by the given center itself, acting as an organizational unit on a competitive basis, and not simply by the Doctoral supervisor.

The fact that different names for Doctoral schools exist in the present debate over attempts to institutionalize pilot projects, ranging from *Doktorandenkollegs* and *Promotionskollegs* to *Graduiertenzentren* and *Graduiertenkollegs*, are visible proof that more or less visible conceptional differences with regard to the content and structure of Doctoral studies are assumed and that these need further clarification.

In recent years, the idea of an improved structure for Doctoral training has been accepted by increasing numbers of university representatives for whom the *Graduiertenkolleg* model served as a kind of multiplier. The fifth amendment to the Higher Education Framework Act requires that universities establish institutions for research-oriented studies for all Doctoral candidates who, in turn, must be registered. However, despite a number of single initiatives, no major breakthrough has occurred. Because the process called for is time-consuming, the new provisions of the Higher Education Framework Act must, first of all, be translated into *Länder* laws before becoming the actual practice of universities. For the time being, only six of the sixteen *Länder* have done so. One can assume that the registration of all Doctoral candidates in German universities will not take place until 2005.

In 2003, DFG funded a total of 283 *Graduiertenkollegs*. They are distributed as follows: eighty-four in the Human and Social Sciences (29.7 percent); eighty-three in Biology and Medicine (29.3 percent); eighty-five in the Sciences and in Mathematics (30 percent), and thirty-one in Engineering Sciences and Computer Science (11 percent) (DFG, 2003, p. 5). In 2002, €75 million were allocated among them. As a new innovation, twenty-eight of these are international, *i.e.*, institutions of a German university in association with one or two foreign co-operation partners. These partners should be foreign institutions that already offer structured Doctoral training, *e.g.*, graduate schools in the Anglo-Saxon countries, *Ecoles Doctorales* in France, or *Onderzoekscholen* in the Netherlands.

International *Graduiertenkollegs* should train their Doctoral candidates jointly, thus including an exchange of candidates for at least six months. Also, joint Doctoral degrees from the institutions of two countries are planned (*co-tutelle-de-thèse*). In sum, it can be said that the focus of international activities continues to be on institutions in Western Europe. More than half of all co-operation projects and exchange programmes are organized with scientists from West European Countries, and more than two-thirds of all travel abroad by young scientists is to countries in Western Europe. The United States and Canada represent 18 percent of foreign travel, and the Central and Eastern European countries, 7 percent.

In addition, further promotion programmes are in the process of being set up on initiatives undertaken by the *Länder* of Lower Saxony, North-Rhine Westphalia, and Bavaria, by the Max Planck Society (the Max-Planck-Research-Schools), by DAAD (*Deutscher Akademischer Austausch Dienst* - The German Academic Exchange Service) and DFG (*Deutsche Forschungsgemeinschaft* - Doctoral degrees at German universities), and by

the Volkswagen Foundation (the Graduate School of Social Sciences at the University of Bremen). At different universities, institutionalized graduate programmes display similar organizational features but do not offer stipends for Doctoral candidates.

In North-Rhine Westphalia, the six Graduate Schools are organized as permanent interfaculty institutions under the responsibility of the Rector/President of the university with sixty Doctoral candidates per graduate school, whereas the twenty-eight international Max-Planck Research Schools are set up for twelve years and are based upon cooperative arrangements among Max Planck Institutes and one or more universities (often including international partners).

The graduate schools in Lower Saxony are organized along the lines of those in North-Rhine Westphalia. At present, ten of them exist with a total of 108 Doctoral candidates, of which nine are in the Sciences and in Engineering. Bavaria also announced the setting up of ten *Internationale Doktorandenkollegs*. They will be established with sufficient posts in order to attract excellent Doctoral candidates. In all cases, high priority is given to internationalization.

The financial support available to Doctoral candidates varies considerably. The monthly scholarship for a Doctoral candidate amounts to €921 (€1,365 in Engineering and Computer Science) in a *Graduierertenkolleg*, to €975 in a Max Planck Research School, and ranges between €1,270 (the Sciences), €1,540 (Engineering), and €1.790 (Computer Science) in the Graduate Schools of North-Rhine Westphalia. By comparison, it should be mentioned that a university assistant (e.g., 25 years old, single, with no children) receives between €964 (BAT IIa, part-time position) and €1.516 (BAT IIa, a full position).

To summarize, despite forty-two innovative projects, no “mushrooming” of graduate schools at German universities can be observed for the time being. Although the total has increased to over 150, most of them are in a phase of experimentation. The anticipated multiplier effect of the *Graduierertenkollegs* has not yet taken place, even though structural changes have become increasingly necessary. The introduction of junior professorships and the decreasing importance of the *Habilitation* as a condition to be met to hold a life-time tenured professorship are increasing the importance of well-structured graduate studies with clearly defined responsibilities and transparent procedures. The rising average age of graduates in almost all subjects (cf. Table 5) requires that these institutional changes be made in order to reduce the average duration of Doctoral studies to three years, as recommended by HRK and the Science Council. The step-by-step introduction of a consecutive curricular system (as in Bachelor’s and Master’s degree studies) offers new options for linking the phases of the first and the second degrees with Doctoral studies. These challenges must be viewed in the light of the increasing internationalization of all science sectors.

The Science Council (2002) as well as HRK (2003) fully recognize these challenges, because at present fewer than 10 percent of Doctoral

candidates are trained in structured programmes. In their recommendations, these organizations offered a set of suggestions to the universities by which they could overcome present structural deficits. At the same time, they again appealed to the Federal and the *Länder* governments to improve the financial situation of German higher education institutions. They particularly stressed the need to rectify the situation of insufficient basic funding and limited third-party funding of universities as compared to the research conditions for Doctoral candidates in non-university research institutions, in industrial laboratories, and in foreign universities and research institutions. The political decision-makers are called upon to provide sufficient funding for the training of Doctoral candidates in order to reach a major breakthrough in the setting up of fully institutionalized graduate studies at German universities.

Still, one must admit that funding is only one side of the coin. The other side is the need for a fundamental organizational change within German universities. This need is closely linked, not only to institutional abilities, but also to an individual willingness for change. Because the traditional German model of Doctoral training (the “apprenticeship model” according to Bob Clark) can also be characterized as a highly individualized, non-transparent “dependency model”, as viewed by the Doctoral candidates (in the worst cases, it can also be called an “exploitation model”).

The recommended graduate schools (*Promotionskollegs*), to be formed along the lines of the American model, require a transparent de-coupling of the functions of selection, admission, tutoring, and examination within a framework of quality-oriented competition.

HRK explicitly stressed the necessity of a structural change by referring to the development towards a European Higher Education Area, characterized by a merger of the European Union Research Framework Programme with the Bologna Process (*HRK*, 2003, p. 2). The full participation of German universities will only be possible if they offer internationally accepted organizational arrangements in the form of *Promotionskollegs*. The *HRK* also stressed that the Bologna Process will be extended from the first two phases of study (Bachelor’s and Master’s degree levels) to the Doctoral phase as the research-related level. *HRK* argues that the American model of integrated graduate training, which builds upon the first degree awarded after college or upon the first study phase, seems to be becoming the dominant variant all over the world (*HRK*, 2003, p. 2). This trend implies a clear cut after the first cycle and would demand a close structuring of the second cycle with Doctoral studies within graduate schools. The *Wissenschaftsrat*, however, favours a model which leaves responsibility for the Bachelor’s as well as the Master’s degree within the faculties. At the same time, the Council argues that Doctoral studies should not be planned as a third cycle. Whether the present debate in Germany becomes an anticipated evolutionary “bottom-up” reform process, leading to over-all structures of Doctoral studies in a transparent and consistent way, still remains an open question.

BIBLIOGRAPHICAL REFERENCES

- DEUTSCHE FORSCHUNGSGEMEINSCHAFT (DFG). *Entwicklung und Stand des Programms "Graduiertenkollegs". Erhebung 2003* [Development and Current State of the Programme "Graduiertenkollegs". Survey of 2003]. September 2003, p. 4 and 5.
- DFG/DAAD, ed. *Tagungsdokumentation International Promovieren an Hochschulen in Deutschland*. [Documentation of the Conference "International Doctoral Studies at Universities in Germany"] Bonn: DAAD, April 2003.
- HOCHSCHULREKTORENKONFERENZ (HRK). *Zum Promotionsstudium. Entschliessung des 179. Plenums vom 9 Juli 1996* [Doctoral Studies. Decision of the 179th Plenary Session, 9 July, 1996], p. 34. <<http://www.hrk.de/beschluesse/1883.htm>> [also available in English].
- HOCHSCHULREKTORENKONFERENZ (HRK): *Zur Organisation des Promotionsstudiums. Entschliessung des 199. Plenums vom 17-18 Februar 2003* [The Organization of Doctoral Studies. Decision of the 199th Plenary Session, 17/18 February, 2003], p. 12 <<http://www.hrk.de/beschluesse/3022.htm>>.
- HUBER, L. "A Field of Uncertainty: Post-Graduate Studies in the Federal Republic of Germany", *European Journal of Education* 21 2 (1986): 287-305.
- KEHM, B. M. *Higher Education in Germany: Developments, Problems, and Perspectives*. Bucharest: UNESCO-CEPES, 1999.
- KUPFER, A., and MOES, J. *Promovieren in Europa. Ein internationaler Vergleich von Promotionsbedingungen* [Doctoral Studies in Europe. An International Comparison of the Conditions for Doctoral Studies]. Frankfurt-am-Main: Gewerkschaft Erziehung und Wissenschaft [GEW], 2003.
- RHOADES, Gary. "Graduate Education", in, P. G. ALTBACH, ed. *International Higher Education: An Encyclopedia*. Vol. 1. New York and London: Garland, 1991, pp. 127-146.
- WISSENSCHAFTSRAT. *Empfehlungen zur Doktorandenausbildung* [Recommendations Concerning Doctoral Training]. Drucksache 5459/02. Saarbrücken, 15 November 2002, p. 119 <<http://www.wissenschaftsrat.de/texte/5459-02.pdf>>.

IV. Italy

ROBERTO MOSCATI

1. THE RECENT EVOLUTION OF ITALIAN HIGHER EDUCATION

In recent years, the Italian higher education system has been undergoing a reform aimed at decentralizing its traditionally monolithic structure inherited from its Napoleonic origins and based on the comprehensive power of the Ministry in Rome. An innovative idea called for the grant of larger degrees of autonomy for universities.

As of 1996, the Ministry of Universities has been introducing a number of measures aimed at granting increased power to individual universities and at changing, at the same time, the operational methods of the entire system of higher education. The combination of autonomy and evaluation has represented a new way of considering the system. It is now to be viewed as a collection of independent entities, co-ordinated by a center, which is no longer the Ministry itself, but an intermediate structure, a buffer, created by the Ministry but made up of academic staff members. This buffer is the Evaluation Observatory (*Osservatorio della valutazione*), later renamed the National Committee for the Evaluation of the University System (*Comitato nazionale per la valutazione del sistema universitario*) having the task of linking together, in a network, all the Evaluation Centers of the various universities. As part of the same policy, the Italian Rectors Conference (*Conferenza dei Rettori Italiani - CRUI*) has also evolved into a coordination center that has increasingly assumed the role of an intermediary body between the universities and the State.

Some problems have arisen in the implementation of this reform. In addition to the resistance of a part of the academic staff, the main organizational difficulties concern:

- The budgetary autonomy granted to the universities, and inside them, to the departments. This change has implied greater responsibility and has required new administrative skills on the part of personnel at different levels.
- The new *curricular* structure: three sequenced tracks leading to the first degree (*laurea*) after a three-year course programme; to the second degree (*laurea specialistica*) after two more years of study, and to the third degree (*dottorato di ricerca*) after an additional study period of three years. This structure (of three-, five-, and eight-year paths), inspired by the Bologna Declaration, has modified the traditional one-level system (referring to the first degree, the *laurea*, with the Doctoral degree being limited to a few recipients, as will be described below).

- The introduction of a credit system, to make courses and degree programmes more flexible and more open to an international dimension.
- The expansion of the university assessment procedures having economic effects, in terms of incentives or penalties related to performance.

Resistance also came as a consequence of the curricular reform. The three-to-five-year structure was conceived as a way of better relating university course programmes to the changing professional needs of the economy. On the one hand, this new perspective led to the possibility of creating new training courses for emerging professions; on the other hand, it created problems for teachers as they needed to shorten the first level of university studies from four- to three-year course programmes.

In recent years, there has been a proliferation of courses with new titles related to a large variety of professional profiles (some of them not existing on the labour market) and often representing only the personal interest of certain prominent academics eager to enlarge their power through “their” new courses and the related new openings for teaching positions. At the same time, the teaching staff interpreted the reduction in the duration of course programmes as a lowering of the cultural and scientific level of universities as institutions for the dissemination of knowledge at high levels. This interpretation was particularly current in certain disciplinary areas like Law and the Humanities. It is possible to say that, in this respect, at least for a part of academe, the reform marked the end of the “university for the élite”, conceived by many as still existing, even though attended by more than 40 percent of upper secondary school graduates.

The reform has been underway for three years. The first cohort admitted under this system has graduated. In many cases, also, the second level of studies (the plus-two) leading to the *laurea specialistica* has begun. However, the resistance on the part of certain academics has still found an interested echo in the recently elected government. A committee has therefore been created by the new Ministry of Education, University, and Research (*Ministero dell'Istruzione, dell'Università e della Ricerca* - MIUR) to consider possible changes.

So far as the academic staff is concerned, the committee has transmitted some informal “suggestions” to the Ministry.

- The recruiting process for full and associate professors should be revised so as to introduce an evaluation at national level every two years for each disciplinary field. Each university would then be able to choose from the list of qualified candidates those considered suitable to its own needs.
- The universities should be authorized to hire new professors on a temporary basis (three-year contracts to be renewed only once) with the possibility of transforming temporary positions into tenured positions following an internal evaluation.

- As for researchers, the universities should also be permitted to hire them on a temporary basis (five-year contracts with one renewal), while developing their own hiring procedures and giving special consideration to candidates holding the Doctoral degree or other postgraduate credentials.

2. THE NATIONAL DOCTORAL PROGRAMME

An Ambiguous Start

What follows describes the framework within which the national Doctoral Programme has been set up and is now operating.

Doctoral studies were set up in 1980 as the result of a law aiming at reorganizing the entire system of higher education. The previous decade had witnessed a steady growth of social demand for higher education that was favoured by the open-doors policy of admission to universities, introduced in the late 1960s. The multiplication of student numbers required a rapid increase in the numbers of teachers who were hired on a temporary basis through a proliferation of fellowships and contracts, because the regular procedure for recruitment would have required an inordinate amount of time. To bring some order to these members of the academic staff and to deal with possible demands on the part of the labour unions, the entire structure of the academic career was revised. The two categories, *professor* and *assistant* (both tenured), were transformed into three categories (*full professor*, *associate professor*, and *researcher*, all tenured). The national Doctoral Programme was created as a way to prepare prospective scholars for an academic career, or, more generally, for research activities. This rationale has to be kept in mind, as it explains the subsequent role of the Doctorate in the Italian system of higher education.

The rules for the setting up of Doctoral programmes were strict. The universities which asked the Ministry of Education to be authorized to set up a Doctoral programme had to demonstrate the quality of their structures and faculty. Entrance examinations were mandatory and were used to assess the candidates' capacity to conduct scientific research. Professors were expected to evaluate the performances of the candidates during a training period. The final examination included the discussion of a written thesis with "relevant scientific value" before a National Commission appointed by the Ministry.

The total number of places made available for the entire university system each year had to be related to the estimated demand for researchers in different areas of the private and public sectors. All the places were funded by ministerial fellowships. As a consequence, the number of places made available for the Programme every year had to be limited. Universities were allowed to establish consortia to share resources and to reach a "critical mass" in order to enable small, peripheral institutions to participate in the Programme.

An almost endless debate, begun at the start of the Programme, is still going on today. It refers to two possible traditional alternatives for the didactic organization of the Doctorate: the institution of an organized and formal period of training (that is to say, a graduate school) or reliance on personal relationships between faculty/mentors and students. The limited number of students admitted to the Programme favoured the latter alternative, a choice which revealed traditional pros and cons (variations according to the various disciplinary fields), including the inappropriate utilization of Doctoral students as unofficial teaching assistants to their mentors.

The length and the structure of the Programme have also been the subjects of debate. In principle, the training Programme has to last three years, one of which, it is hoped, should be devoted to experience abroad. In practical terms, the bureaucratic procedures (the composition of recruiting commissions and of evaluating commissions), as well as the organization of training periods in foreign countries have turned out to be inefficient. The real duration of the Programme in individual cases has become unpredictable.

A typically Italian subject of debate, that started almost immediately after the inception of the Programme, is related to the legal value of the Doctoral degree. One view holds that it is up to the labour market to give value (*de facto*) to the degree. On the other hand, it is argued that some formal (*de jure*) recognition is needed on the grounds that awareness of the relevance of the Doctorate has to be generated and that in a national competition for public employment (including university recruitment) the formal value of academic titles is crucial.

The debate has had more relevance than one might imagine, if viewing the problem from the outside, for the crucial problem for the Doctoral Programme has always been its perceived relationship with the labour market. Thus, the assumed basic weakness is based on the lack of interest in the Doctorate demonstrated by the industrial sector and by private and public companies, in general. The reasons for this attitude can be found both in the limited size of Italian industrial plants and firms (in which research is not taken into consideration and the management is of an artisanal nature) and in the tradition of training researchers inside firms of different sizes, instead of hiring persons already trained to a certain level. Almost half of company researchers do not have a first university degree. Under these circumstances, the area left is that of university and research institutes. Here, the problem is that of the recruitment policy which – in the 1980s – was based on the effort to progressively insert into tenure track positions the large majority of the academic staff, the members of which had been hired on a temporary basis. A fixed number of tenure track positions has been established for the three categories (full professors, associate professors, and researchers). Once the positions have been filled, “the doors were closed”, in complete disregard of the question of aging and the need for a physiological turnover.

To ease the pressures on the new generation of scholars interested in research careers and to avoid losing all of them, a new kind of post-Doctoral fellowship has been created by the Ministry of the University and Research (meanwhile established as a separate entity from the Ministry of Education). The idea was to provide certain chances for prospective researchers so as to encourage them to remain in the academic and research milieu, while waiting for an opportunity to be appointed to a permanent position. At the same time, certain priorities have been established in the recruitment of the Doctorate holders in university and research institutes (at that time, always carried out at national level).

The First Recruitment Period

The first period of existence of the Doctoral Programme was characterized by a limited number of enrolled students. This situation was linked to the number of fellowships that had been made available by the Ministry of the University, since it was not possible to activate a place not covered by a fellowship.

Table 1. Numbers of students enrolled over the first decade of the Doctoral Programme

Cycles	Years	Numbers of students
1	1983	2,097
2	1985	2,038
3	1986	2,151
4	1988	3,642
5	1989	2,589
6	1990	4,001
7	1991	4,012
8	1992	4,007

Source: CINECA (*Consorzio Interuniversitario per il Calcolo Automatico dell'Italia Nord Orientale*).¹

Table 2. Doctoral fellowships by numbers of degree holders and fields of studies

Scientific fields	Doctoral places ¹	First degree holders ²	(%)
Natural Sciences	857	11,690	7.3
Medicine	806	12,202	6.6
Agriculture	254	2,882	8.8
Engineering	780	11,867	6.6
Humanities	637	16,985	3.7
Law	290	12,554	2.3
Economics	266	11,612	2.3
Social and Political Sciences	115	4,242	2.7
TOTAL	3,334	55,628	6.0

¹ Doctoral places in 1990.

² Degree-holders in 1989.

¹ CINECA - Interuniversity Consortium, consisting of twenty-three universities, under the supervision of MIUR, acting as a computing center in the service of public and private research activity.

Source: ISTAT (Italian Institute for Statistics).

The distribution of fellowships according to scientific field turned out to be rather uneven, with the hard sciences being more prepared to provide this kind of opportunity for their young scholars and interested in offering them a realistic chance in an academic career.

3. PROGRAMME DEVELOPMENT

The numbers of students admitted to the Doctoral course programme expanded substantially at the beginning of the 1990s. They remained stable until the end of the decade, when the admission policy changed and students without fellowships could be admitted to the course programmes. The numbers of Doctoral dissertations expanded accordingly, even though as per a non-linear trend, mostly owing to varying durations in the time needed to write a thesis. The number of women among Doctorate holders also increased steadily, from below 40 percent of the total to more than 50 percent (Table 3).

Table 3. Students admitted to Doctoral courses and Doctorates granted (from the 1987-1988 to the 2000-2001 academic years) (in numbers)

Academic years	Students admitted			Doctorates granted	
	Cycles	Absolute values	Variation related to the previous academic years (%)	Absolute values	Women (%)
1987-1988	3	2.151	5.5	1.127	38.7
1988-1989	4	2.918	35.7	347	47.6
1989-1990	5	2.551	-12.6	1.003	37.9
1990-1991	6	3.992	56.5	1.170	42.2
1991-1992	7	4.012	0.5	734	45.5
1992-1993	8	4.008	-0.1	2.000	41.6
1993-1994	9	3.997	-0.3	2.133	45.7
1994-1995	10	4.000	0.1	2.386	42.5
1995-1996	11	4.006	0.2	2.920	46.0
1996-1997	12	3.997	-0.2	3.079	45.0
1997-1998	13	4.737	18.5	3.894	51.1
1998-1999	14	4.730	-0.1	2.804	45.5
1999-2000	15	7.346	55.3	3.507	53.1
2000-2001	16	8.661	17.9	3.976	51.1

Source: ISTAT, MIUR.

The introduction of places not covered by fellowships awarded by the Ministry of the University increased the overall rate of participation in the Doctoral Programme. Certain fellowships (very few) were made available by private sources, as the numbers of students deciding to take part in the Programme at their own expense increased. Fees, after all, are not that expensive, for, in general, course programmes fees in Italian universities range from €700 to €1,200 per year.

One should note that not all vacancies are currently being filled, mostly because of the severe selection for admission, while the number of women

exceeds that of men. The participation of “foreigners”, although growing, remains modest (Table 4).

Table 4. Numbers of available places and students admitted to Doctoral courses (from the 1998-1999 to the 2000-2001 academic year)

Cycles	Available places	With fellowships	Admitted to courses			Foreigners		
			Men	Women	Total	Men	Women	Total
14	5,195	-	2,307	2,281	4,588	16	11	27
15	8,268	5,305	3,592	3,754	7,346	89	55	144
16	10,010	6,068	4,215	4,446	8,661	112	83	195

Source: MIUR.

It is of some relevance to indicate that many cycles (lasting at least three years, but often more, as has been mentioned) overlap. As a result, the total enrollment in the Programme every year has exceeded 25,000 (Table 5).

Table 5. Total numbers of students enrolled in various Doctoral programme cycles (2001-2002 academic year)

Total	Cycle	Enrolled students	
		Men	Women
	17	4,144	4,361
	16	3,866	4,174
	15	3,349	3,519
	14	864	983
	13	123	238
	12	27	49
25,697	of which	12,373	13,324

Source: MIUR.

The distribution of students in the Doctoral programme is also of some interest. Table 6 below illustrates the predominance of the hard sciences along with Medicine, the Natural Sciences, and Engineering. This ranking has something to do with the prospective professional occupation of Doctoral students, since it coincides with the number of available places in research institutes, both inside and outside the university milieu. Difficulties in the other sectors of the labour market are also exercising a proportional influence on the choices made by students (Table 6).

The expanding number of enrollments over the years is yielding an expanding number of students who are awarded Doctorates. In particular, the proportion of women is steadily increasing (Tables 7 and 8).

The distribution of Doctoral-degree holders by disciplinary fields reveals the prevailing impact of the Natural Sciences, of Engineering, and of fields related to Medicine (as in the case of enrolled students). An important role is played by Agriculture, in which the holders of research Doctorates may find employment in the advanced sectors of specialized production (Table 9).

Table 6. Students enrolled by fields of study in several cycles of the Doctoral programme (2000-2001 academic year) (in numbers)

Fields	Enrollments by cycle												Total enrollments		
	16		15		14		13		12		11		Men	Women	Total
	Men	Women	Men	Women	Men	Women	Men	Women	Men	Women	Men	Women			
Agriculture	211	247	185	184	91	116	7	6	0	0	0	0	494	553	1,047
Architecture	159	201	134	190	93	112	12	35	1	0	0	0	399	538	937
Biomedicine	220	468	222	376	95	199	63	97	12	15	2	5	614	1,160	1,774
Economics and Statistics	246	226	252	207	148	149	38	33	2	4	5	1	691	620	1,311
Pharmacy	63	139	42	118	30	77	3	17	0	0	0	0	138	351	489
Law	256	239	242	265	158	139	63	79	8	11	4	5	731	738	1,469
Engineering	971	310	807	288	529	175	26	17	10	4	6	5	2,349	799	3,148
Humanities	440	665	437	617	249	334	100	167	14	14	1	1	1,241	1,798	3,039
Medicine and Veterinary Sciences	301	544	295	479	188	280	90	153	6	18	0	1	880	1,475	2,355
Mathematics and Natural Sciences	690	690	616	562	419	366	119	94	4	1	0	1	1,848	1,714	3,562
Political Science	139	111	103	85	63	57	19	22	2	1	0	0	326	276	602
Undefined fields	121	205	120	213	73	105	31	51	1	4	0	0	346	578	924

Source: MIUR.

Table 7. Holders of research Doctorates (1988) (in numbers)

Doctorate-degree holders by cycle												Foreigners not holding fellowships		Total Doctorates		
7		8		9		10		11		Foreigners (all cycles)						
Men	Women	Men	Women	Men	Women	Men	Women	Men	Women	Men	Women	Men	Women	Men	Women	Total
28	42	70	41	435	435	764	624	189	112	11	4	42	21	1,528	1,275	2,803

Source: MIUR.

Table 8. Research Doctorates (2001) (in numbers)

Doctorate-degree holders by cycle												Foreigners not holding fellowships		Total Doctorates		
7		8		9		10		11		Foreigners (all cycles)						
Men	Women	Men	Women	Men	Women	Men	Women	Men	Women	Men	Women	Men	Women	Men	Women	Total
12	20	136	128	496	606	1,066	1,114	145	162	28	11	25	13	1,880	2,043	3,923

Source: MIUR.

Table 9. Research Doctorates by field of studies in several cycles (year 2001) (in numbers)

Disciplinary Fields	Research Doctorates by cycle												Foreigners without fellowships		Total research Doctorates		
	10		11		12		13		14		Foreigners (all cycles)				of which		
	Men	Women	Men	Women	Men	Women	Men	Women	Men	Women	Men	Women	Men	Women	Total	Men	Women
Agriculture	5	6	5	13	19	24	94	117	21	23	1	1	5	4	336	149	187
Architecture	0	2	11	9	29	38	27	32	4	2	2	0	5	0	159	76	83
Biomedicine	0	0	16	19	42	89	31	63	9	14	2	1	2	2	287	100	187
Economics and Statistics	0	0	17	8	43	39	79	94	4	5	0	0	2	1	292	145	147
Pharmacy	0	0	0	1	2	9	14	39	3	5	4	0	0	0	73	19	54
Law	2	2	28	22	63	37	52	48	11	7	5	2	0	2	274	156	118
Engineering	0	0	1	0	37	14	346	164	10	4	4	5	0	0	576	394	182
Humanities	3	10	36	35	96	150	65	134	9	14	5	0	5	2	559	214	345
Medicine and Veterinary Sciences	1	0	2	8	40	79	97	133	33	42	1	2	2	1	438	175	263
Mathematics and Natural Sciences	1	0	13	7	102	96	232	241	41	46	4	0	3	1	783	392	391
Political Sciences	0	0	5	4	10	8	14	18	0	0	0	0	0	0	59	29	30
Undefined fields	0	0	2	2	13	23	15	31	0	0	0	0	1	0	87	31	56

Source: MIUR.

4. LIMITS AND DIFFICULT-TO-RESOLVE CONTRADICTIONS

Since the start of the Doctoral programme during the 1983-1984 academic year, the individual Doctoral programmes were conceived – at least, informally – as the first step in an academic career. In fact, the large majority of young scholars admitted to programmes did not have many alternatives on the labour market, for the other professional sectors were not interested in Doctorate holders. During the first years, all participants in Doctoral programmes were subsidized by ministerial fellowships for the entire three-year period of training. This procedure restricted the total number of students to the global value of the fellowships offered by the government each year. As a result, the number of enrolled students was around 2,000 during the first period; then, it went up, little by little, to twice that number, ten years later. Very recently, the number increased substantially even more, thanks to a change in the rules of admission, which gave the universities the possibility of admitting students without fellowships and of hunting for fellowships from different sources (basically in the private sector).

Of course, not all the graduates of Doctoral programmes are interested in or are trying to have an academic career. But a relevant majority is doing so. A further step in this direction is represented by a four-year post-Doctoral fellowship programme that has been set up by the government and is being administered by each university. Those who are awarded one of these fellowships are considered (in the university milieu) to be prospective scholars who should be directed towards an academic career. The numbers of post-Doctoral fellowships are very difficult to assess since the universities use them in different ways, often including certain young researchers holding post-Doctoral fellowships in the budgets of research projects, from which it is difficult for them to emerge. It is fair to say that this kind of fellowship covers about two-thirds of the Doctoral candidates.

Doctoral students and holders of post-Doctoral fellowships, in general, are involved in academic life in different ways. Almost all of them take part in research activities, for these activities are formally prescribed as part of their training. But increasingly they are also being asked to participate in teaching. This involvement represents a critical point of debate because, during the first period, the law clearly prohibited Doctoral students from engaging in any teaching activities, considering them to be young researchers who should be devoting all their time and effort to research and to their basic theoretical formation.

More recently, this attitude has changed and teaching activities are now conceived as part of the development process of young scholars. A 1998 law recognized the possibility of certain kinds of unremunerated teaching activities for Doctoral students and post-Doctorate fellowship holders, considered as part of their training.

In turn, the research-Doctorate holders created an association (*Associazione Dottorandi e Dottori di Ricerca Italiani* – ADI) in order to publicize such problems and to obtain recognition of their status, in terms

of competition for public employment, and to help members find decent employment. The association maintains that the growing involvement of Doctoral students, research Doctorate holders, and post-Doctoral fellowship-holders in unremunerated teaching activities sets back their training, for they are used as teachers who substitute for academic staff, thus saving money for university budgets.

A survey conducted by ADI on a sampling of Doctoral students in 1998 revealed that many of them were actually involved in tutoring, leading seminars, supervising exercises in class, grading examinations, and even offering regular series of lectures. In fact, the steady increase and diversification in teaching activities that has occurred in recent years (thanks to the above-mentioned reform) could not be met by the regular academic staff without the help of "external" teaching personnel, either hired on a temporary basis or chosen from among the postgraduate and Doctoral programme attendees.

On the other hand, the majority of Doctoral students and research Doctorate holders are prepared to accept these teaching activities, in part because they serve as recognition of their status and in part because they cannot refuse to assist those professors who will eventually decide as to their professional future.

This sort of pressure is related (i) to the kind of training provided to Doctoral students, and (ii) to the labour market for research Doctorate holders.

As indicated above, at the start of the Doctoral programme, the most typical form of training for Doctoral students was based on personal tutorship with full professors acting as mentors. Little by little, series of seminars and short courses were especially developed for Doctoral students, but the personal relationship with a full professor (with whom the final thesis had to be elaborated) still remained dominant.

Recently, in some universities, the idea of creating a sort of graduate school has started to gain ground. The idea is to organize a collective effort among more than one faculty or even aggregating more than one university in order to overcome the problem of the small student numbers. By this means, it might be possible to reduce the direct dependence of Doctoral students on senior members of the academic staff. But the results of this transformation will only be seen in the future.

The specific conditions of the labour market for research Doctorate holders have also been cited above. The reasons for the creation of the Doctoral programme were strictly related to the situation of the academic staff and its need to have a formal path for introducing young scholars to an academic career. Thus, the Doctoral programme was tailored to fit academic needs.

The other (non-academic) professions did not require such sophisticated theoretical levels of training. The result was the reduction of almost all possible occupational alternatives to those of an academic career. When asked about their professional future, the large majority of Doctoral students involved in the ADI survey envisaged remaining in the university

milieu (81.3 percent), the highest proportion being in the Social Sciences and the Humanities (86.0 percent) and a lower proportion in Medicine (72.2 percent). Even though they were perfectly aware of the difficulties of an academic career, many expected to obtain a tenure track position in at least five years (32.7 percent) or in ten years (24.9 percent), or even in more than ten years (11.9 percent).

The problem of careers is made more acute by the present economic crisis, which is affecting the budgets of universities and is thus reducing the possibilities for hiring new staff. On the other hand, the weak aspect of the Doctoral programme is its lack of relevance to the professional, non-academic world. In fact, what has been missing for many years in the Italian system of higher education is a professional Master's degree level with its links to the world of enterprises and companies. Only in the last three years has university reform led to the introduction of this intermediate level, the impact of which will be observed in the near future.

5. CONCLUDING REMARKS

To sum up, certain data about the Italian Doctoral programme are worth citing in order to draw certain conclusions.

Over a twenty-year period (1983-2003), about 70,000 places were made available. During the 2003, 27,000 students were enrolled and were completing their course programmes (started in different cycles and lasting, in general, more than the established three years).

Until 1998, all students were granted a ministerial fellowship of €559 (net) per month. As of then, the proportion of places covered by the fellowship began to decline. Now, a little more than half of the students receive a ministerial fellowship of €880 (gross) per month. It has been estimated that the total cost for the entire training period of a research Doctorate is €500,000. Over the year 2002, about 5,000 Doctorates were granted, while during 1987-2002 period, about 42,000 students became research Doctorate holders. Comparing these data with the European standard, it appears that the Italian Doctoral programme achieved only 50 percent of the norm.

If the above are certain *quantitative* elements with which to draw a picture of the programme, it is much more difficult to evaluate the *quality* of training provided. The differences among universities are consistent as appearing from the differences in the structure of training activities cited above. Only recently, a common scheme for the evaluation of Doctoral programmes was established at central level by the National Committee for the Evaluation of University Activities. This scheme has been disseminated among all the internal Evaluation Committees that each University was required to establish by Law. It will then be possible to proceed with a comparative analysis and consequently to bring to bear certain indirect pressures on the universities in order to improve their training activities.

While the impact of these changes remains to be seen, the present situation of research Doctorate holders seems to be deteriorating owing to

the shrinking of the academic labour market and the continued lack of interest in them from the non-academic professional fields. Little by little, the uncertain future is affecting the quality of the candidates in the Doctoral programme. Particularly in the universities of the largest cities of Northern Italy (Milan, Turin, Bologna, and Genoa), where the economic context can offer a number of alternatives, the best students with a first degree find other more appealing alternatives and only the "second best" among university graduates are trying to enter the Doctoral Programme.

It seems that the somewhat murky future for holders of the Doctoral degree will only become clearer through a combination of (i) a changed and individualized recruitment policy for each university and scientific research domain (which requires the allocation of a much higher level of funding to the sector); and (ii) a change in the structuring of graduate courses so as to make them more sensitive to the needs of the external labour market (which requires a change in attitude, to the external world, on the part of academe).

BIBLIOGRAPHY

- ASSOCIAZIONE DOTTORANDI E DOTTORI DI RICERCA ITALIANI (ADI). *La condizione dei dottorandi di ricerca in Italia*. Roma, 1998
<<http://www.dottorato.it>>.
- AVVEDUTO, S., ed. *Il dottorato di ricerca. Esperienze e prospettive*. Rome: CNR, 1994.
- AVVEDUTO, S., and BRANDI, M. A. *Risorse umane: quale futuro nella scienza? Formazione e occupazione*. Milan: Franco Angeli, 2000.
- CESARATTO, S., AVVEDUTO, S., BRANDI, M. C., and STIRATI A. *Il brutto anatroccolo: il dottorato di ricerca in Italia fra università, ricerca e mercato del lavoro*. Milano: Franco Angeli, 1994.
- CLARK, R. B. "Teaching-Study Nexus in Modern Systems of Higher Education", *Higher Education Policy* 7 1 (1994): 11-17.
- FORNASINI, E. et al., eds. *Il dottorato di ricerca. Esperienze a confronto in Italia e in Europa*. Rome: CRUI, 1999.
- FREY, L., and GHIGNONI, E., eds. *Trasformazioni del sistema formativo e qualificazione dell'offerta di lavoro per generazioni*. Milan: Franco Angeli, 2002.
- FREY, L., and GHIGNONI, E. eds. *L'importanza della riforma universitaria in Italia*. Milano: Franco Angeli, 2002.
- ISTAT [Italian Institute of Statistics], *Lo stato dell'Università. I principali indicatori*, Rome, 2003 (typescript).
- MINISTERO DELL'ISTRUZIONE DELL'UNIVERSITÀ E DELLA RICERCA (MIUR). *L'evoluzione del sistema universitario nel triennio a.a. 1998/99-a.a. 2000/01*, Rome, 2002 (typescript).
- PONTREMOLI, S., and LUZZATTO, G. *Università, la riforma è iniziata*. Milano: La Nuova Italia, 2003.
- TROW, M. *Problems in the Transition from Élite to Mass Higher Education*. Paris: OECD, 1974.

V. The Netherlands

EGBERT DE WEERT

This study analyzes the developments and the state of the art with respect to Doctoral education in the Netherlands. The first part shows how the present system originated from debates, that took place in the 1970s, on the structure of higher education. The second part, in particular, describes the major features of the resulting new system, particularly Doctoral education, as well as the emergence of research schools. This part also includes some quantitative trends. The third part covers issues regarding admission, legal regulations, as well as quality mechanisms and the future employment of the holders of Doctorates. Finally, certain trends that illustrate how the system of Doctoral training is being challenged and reshaped in an attempt to adjust to new circumstances will be discussed. The debate has received a new impulse owing to the Bologna Process which, although focusing on the two main cycles, that of the Bachelor's and the Master's degrees, has recently introduced Doctoral education as an integral feature of this process.

1. TOWARDS A MORE STRUCTURED DOCTORAL EDUCATION SYSTEM

The current Doctoral education system in the Netherlands dates back to 1986. That year, a formal system was introduced, meant to regulate education and training for Doctoral students. Up to that point, research training had been an integral part of the standard university education programme amounting to six or seven years. Graduates who obtained a position at a university could carry out their own research leading to the award of a Doctoral degree.

The new system originated from university reforms occurring in the mid-1980s, as the final outcome of a lengthy debate, that had been going on since the late 1960s, to reduce the long duration of academic studies by structuring higher education according to a two-phase model. The first phase would comprise a four-year programme leading to the basic academic degree (the *doctorandus*, roughly similar to a Master's degree), and a second phase, which would continue training for independent research. In the latter phase, students could prepare their dissertations by taking part in an apprenticeship relationship with one or more professors. This proposal has led to much political debate about the structure and duration of academic courses, admission standards, and the place of Doctoral training within the overall system of higher education. It was not until the mid-1980s that a more structured conception became apparent.

Two issues, in particular, played an important role, namely, the structuring and the educational concept of Doctoral training programmes (Van Hout, 1988). The central question regarding the structuring of

Doctoral training is whether or not a research programme should consist of one continuous period of university research training or of two periods consisting of one or two years of research-studentship and a three-to-four-year appointment as an assistant/researcher. In this latter structure, student and employee statuses are separated. With regard to the pedagogical issue, the question is whether or not there should be an educational component in its strict sense, such as required courses and an explicit training plan. If there is no educational component, Doctoral training can be characterized as a learning-by-doing-model, through the undertaking of research activities by which Doctoral students can prepare themselves for the award of a Doctoral degree.

Questions of structure and of pedagogical concept have been central to the debates on Doctoral training to the present day. Subsequent ministers of education have taken particular positions, shifting from a learning-by-doing-model to a clear educational model, and vice versa. The resulting system, introduced in 1986, the one that has been the most dominant system up to the present day, bears this double-faced and equivocally felt character of Doctoral training in the Netherlands.

The so-called AiO-system (*Assistent-in-Opleiding*) has the following major features:

The employment of Doctoral trainees (AiOs) on a temporary basis, usually full-time and, in principle, for a standard four-year period. They are remunerated according to a specific salary scale.

The drawing up of a legal contract between the university, the supervisor, and each individual research trainee, which includes a training and supervision plan.

The employment status in question implies that AiOs hold a distinct academic position. Although they may receive research training and supervision, they are also supposed to contribute to the research output of their faculties. Usually, they are assigned teaching duties and other tasks up to a maximum of 25 percent of their total working time. Generally, they are treated as members of the academic staff.

The double-face of the AiO system is expressed in the remuneration, which is based on a special salary-scale with a built-in deduction for the training and supervision received. The deduction decreases from 45 percent in the first year to 15 percent in the fourth year. These cuts reflect the hybrid character of the AiO-position. Recipients are neither full-time employees nor full-time students.

The training and supervision plan states who is responsible for supervision, for how long the AiOs are entitled to supervision, and what knowledge and skills have to be acquired. AiOs are also assigned a budget which can be used for additional courses, for attending conferences, and so on. It should be noted that the AiO-system does not require a standard set of courses to be taken by all research trainees. An AiO has to devote 75 percent of his or her total employment time to research. After one year, each AiO is assessed. Candidates are successful when they deliver and

defend their final product – a PhD thesis – after which they receive the Doctoral degree.

Thus, the AiO-training system regulates the training of AiOs who have a contractual relationship with their university. They are not students, but employees with a claim on training and supervision. In practice, this combination has led to certain tensions, for example, when the AiO is given additional tasks or when the training and supervision portion is given less attention than it should. The question is one of balance, but in practice, many AiOs have regularly complained that a lack of supervision time would harm the progress of their research.

In addition to the employment of AiOs by the universities, the NWO – *Nederlandse Organisatie voor Wetenschappelijk Onderzoek* [Netherlands Organization for Scientific Research], used to employ research trainees, the so-called “researchers in training” (OiO – *onderzoekers in opleiding*). In essence, these trainees had the same employment conditions as the AiOs, but they fell under a separate regulation with a distinctive employment contract, and their research had a different funding regime. Compared to the AiOs, they were not required to undertake faculty tasks, and their training and supervision were more strictly controlled by the NWO. Since 1999, however, their employment relationship has been transferred from the Research Council to the universities, one of the main reasons for doing so being that the situation of two authority relationships running parallel to each other (the universities and the Research Council) on the work floor is experienced as undesirable. Except for a few research institutes which remain under the auspices of NWO, a difference is no longer made between the two categories. Therefore, in what follows, the term, AiOs, includes all research trainees, *i.e.*, Doctoral students.

Apart from the employment status of research trainees, universities can offer scholarships to those who want to pursue a Doctoral degree (the so-called *bursalen* system). Scholarships offer financial benefits to Dutch universities because the university is not required to pay unemployment benefits in case of unemployment after graduation. As employees, research trainees in the AiO-system are entitled to such benefits, which can weigh heavily on the budgets of universities. Formally, those persons holding scholarships are considered to be students, and those persons in the AiO system, employees. The scholarship programme has been criticized and challenged, but the courts have held that it is legal, because the education and training received benefits individual scholarship-holders rather than the university. Although legally accountable, the universities have abolished the system of scholarships with the exception of one university that offers scholarships mainly to students in the Humanities and the Social Sciences who have fewer possibilities for research funding than those in other fields. It is clear that scholarship-holders have a much weaker academic position than research trainees in the AiO-system.

2. EMERGENCE OF RESEARCH SCHOOLS

More or less parallel to the AiO-system, the early 1990s witnessed the emergence of research schools as an important policy-initiative. Research schools have been established to structure university research and to provide more structured research training. The argument made is that aspiring researchers need further education and training of a sort that can only be provided in an environment of high quality research. Apart from the educational function, research schools were considered, from the beginning, as an important vehicle for stimulating the emergence of centers of excellent research, which would be able to develop an international research climate. A strengthening of the research infrastructure and a proliferation of programmatic research frameworks would enhance both an environment for high quality research and the capacity to compete for sources from the Science Council, industry, and international funds.

The structure and role of the research schools are defined by law. The Royal Netherlands Academy of Arts and Sciences (*Koninklijke Nederlandse Akademie Van Wetenschappen* – KNAW) is responsible for their accreditation. For this purpose, the Academy has established an independent committee with the task of evaluating the performance of all the research schools over a five-year cycle (soon to be changed to a six-year cycle). At present, 107 research schools are formally recognized. An important requirement is that the schools have training programmes. It should contribute to achieving coherence and synergy between research and education at the postgraduate level.

Contrary to research schools (or graduate schools) in other countries – like in the United Kingdom and Germany, where such schools are linked to a faculty, or in the United States, in which a graduate school covers all the faculties of a university – research schools in the Netherlands are organized on an interuniversity basis. They are affiliated with at least one university, but usually with additional ones. Thus, research schools are conceived as core entities in a university system rather than as specialized distinctive institutes. They have budgetary responsibilities on the basis of the funds allocated by the participating universities to the research schools. These schools are organized around particular scientific subject areas, and national AiO-networks have gradually been absorbed by these research schools (for the development of the research schools in the Netherlands, see Blume *et al.*, 2000; Bartelse *et al.*, 2001).

However, research schools are selective and AiOs do not participate in all of them. In any case, the university to which an AiO belongs is the only institution entitled to award his or her Doctoral degree. KNAW formulates the two main objectives of research schools (KNAW, 2002) as follows:

- i. *To provide a scientifically stimulating environment for carrying out high quality research.* The fulfillment of this requirement calls for clear organization – the planning of research themes, research programmes, and systematic personnel policies;

- ii. To provide a curriculum for the aspirant-researcher tuned to the specific subject field. This curriculum should take into account the multidisciplinary collaboration, which research functions require both within and outside the university, as well as the requirements of functions outside science; thus, (a) a structured programme for courses and supervision; (b) general and subject-related courses which are linked to a mastery of the subject; and (c) continuous supervision of Doctoral students.

3. QUANTITATIVE TRENDS

The AiO system has been expanding since its start-up in 1987. Although it experienced a decline in the mid-1990s, it has been steadily increasing since then. Table 1 portrays the numbers of Doctoral students in 1990, 1995, 2000, and 2001 in the training system.

Table 1. Total Doctoral students by field of study (in numbers; women, in percentages)

	1990		1995		2000		2001	
	Total	Women	Total	Women	Total	Women	Total	Women
Agriculture	219	31	280	36	314	48	330	48
Natural Sciences	1,119	21	970	28	1,158	33	1,355	33
Engineering	736	10	1,145	14	676	26	1,430	24
Health Sciences	726	41	892	55	1,003	62	809	63
Economics	247	18	291	18	269	29	284	29
Law	244	41	281	47	226	47	229	47
Social Sciences	568	47	555	51	528	59	651	60
Humanities	523	43	418	47	346	52	441	52
Other	54	24	82	26	84	30	103	34
Total	4,436	30	4,914	35	4,604	44	5,632	41

Sources: VSNU/WOPI (various years).

These figures concern all those employed by universities and the NWO Research Council taken together. Although, in the past, these figures were separated, such is no longer the case. As stated above, since 1999, the universities became the formal employers of all research trainees, with the exception of a few researchers at certain specialized research institutes, which belong to a distinctive regime. The table portrays a gradual increase in the numbers of Doctoral students. A remarkable finding is the considerable switch regarding the numbers of Doctoral students in Engineering from 1995 to 2001. This switch is mainly due to the fact that the Technical University of Delft (one of the three major technical universities) regrouped all the Doctoral students in the AiO-system into a separate staff category (Other academic staff). In 2001, this university used the AiO staff category again, with the result that the year 2000 gives a biased figure so far as Engineering is concerned.

The percentage of students entering Doctoral studies as a proportion of all students having completed the first degree varies considerably by discipline. About 9 percent of all university students enrolls in research

trainee positions. The figure is much larger in the Natural Sciences (about one out of three graduates) and Medicine (one out of five) than in other subjects. Of the total of new entrants in 2000, about 50 percent enrolled in the Natural Sciences and in Engineering.

The total enrollments in the AiO-system have increased, in the last few years, from 4,602 in 2000 to 5,632 in 2001. Despite certain administrative rearrangements by certain universities, which resulted in an overestimation of these figures, the system has expanded considerably. The figures for 2001 indicate that of the AiOs, 60 percent is represented by men and 40 percent, by women.

Table 2 lists the total numbers of Doctoral degrees awarded in the last decade, including all the awardees in the AiO-system and all those not formally enrolled in a Doctoral training system. The figures include those who were part of the academic staff and those who applied for a Doctoral degree from an external position.

Table 2. Total numbers of Doctoral degrees awarded by field of study

	1992	1995	2000	2001
Agriculture	114	150	185	207
Natural Sciences	515	555	478	488
Technical Sciences	346	426	364	404
Health (incl. Medicine)	584	683	693	754
Economics	88	121	98	110
Law	79	95	83	93
Social Sciences	235	277	243	264
Humanities	206	256	215	211
Other	0	1	0	3
Total	2,167	2,564	2,359	2,534

Sources: VSNU/KUOZ (various years).

This table shows that the total of Doctorates awarded exceeds the numbers of Doctorates earned through the AiO-system. In other words, the traditional way of writing a dissertation in a master-apprentice relationship (candidates either from within universities or from outside) remains a generally accepted practice.

One of the objectives of the AiO-system has been that of increasing the numbers of Doctoral degrees awarded. Table 3 portrays the proportion of degrees obtained from two AiO-cohorts.

Table 3. Doctoral degrees in the AiO-system, entrants of 1990 and 1995 cohorts
(in percentages)

		x<4	4-5	5-6	x>7	Quit	Degree
1990	1,754	7	32	20	14	8	73
1995	1,641	6	17	10	2	8	35

Source: VSNU/KUOZ (various years).

Comparing both cohorts, it appears that AiO participants are taking increasingly more time to finish their Doctorates. Of the group starting in 1990, 59 percent had completed their Doctorates within six years. For the group starting in 1995, the figure was 35 percent. Those who have quit the

system have done so mostly during their contractual four-year periods. It is unclear whether or not those who have not yet finished their dissertations are still working on them. The success rates are viewed as very low, thus, unsatisfactory, given the fact that the employment contract expires after four years and candidates are eligible for unemployment benefits on the condition that they be available for the labour market.

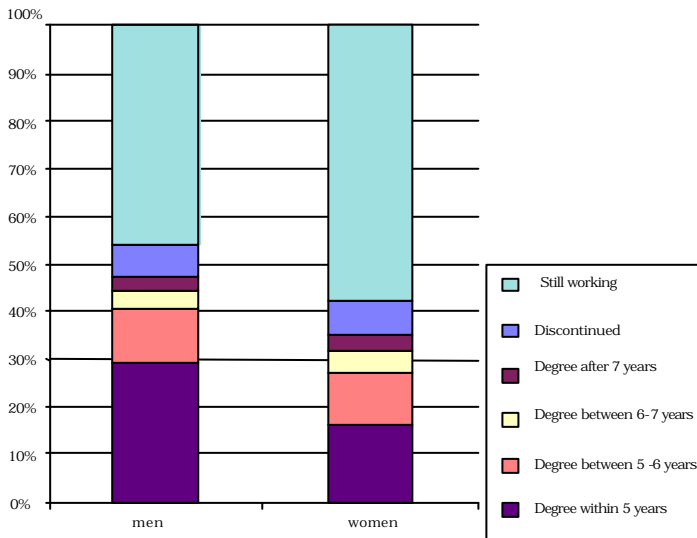
Table 4 illuminates the average length of Doctoral studies. It appears that the majority (45 percent) undergoes between four and five years of Doctoral training. This generalization applies particularly to students in the Natural Sciences, Engineering, Health (Medicine), and Economics. Students in the other subject-fields take more time to finish their degrees.

Table 4. Average length of Doctoral studies, by field of study, and by percent per given numbers of years (1986-2001)

	Total	x<5	5<x<6	6<x<7	x>7
Agriculture	841	38	34	16	12
Natural Sciences	3,473	64	24	8	4
Engineering	2,519	72	20	5	3
Health	1,981	54	30	9	7
Economics	579	69	15	9	7
Law	386	28	30	22	20
Social Sciences	1,153	38	33	17	12
Humanities	796	36	31	17	16
Total	11,728	57	26	10	7

Source: VSNU/KUOZ (2002).

Figure 1. Average length of study - men and women



Sources: VSNU/KUOZ (2002).

Figure 1 compares the average length of time required by men and women to complete a Doctorate (or to abandon it). It appears that a larger proportion of men than women finishes within five years.

There are no figures available regarding the average age at the time of a Doctoral degree award. Nearly 80 percent of Doctoral students in the AiO-system is under 30 years of age, which means that those who graduate are around 30 years old. Since students in Law, the Social Sciences, and the Humanities take more time to graduate, they are a few years older. The numbers of Doctoral students in the 25-29 age group increased from 61 percent (in 2000) to 64 percent (in 2002) and the 30-35 age group, from 15 percent (in 2000) to 17.6 percent (in 2002), which may indicate a trend that the average age at time of graduation is rising.

The proportion of graduate students of foreign nationality, in Dutch universities, is growing. Some departments have up to 40 percent foreign students (mainly in the Natural Sciences and in Engineering), whereas in other departments, the figure is much smaller and is sometimes negligible. It is generally believed that foreigners do quite well in the training system and that they have, proportionally, as satisfactory a success rate as their Dutch counterparts. However, no national data are available regarding the numbers of Doctoral degrees awarded to foreign students.

4. ORGANIZATION OF DOCTORAL STUDIES

Admission and Legal Regulations

Admission is based on the successful completion of the standard Dutch university degree, obtained after four years of study (for Engineering, five years), which is internationally comparable to the Master's degree. Usually, the discipline of the basic degree must be related to that of the Doctoral degree; however, the importance of this requirement is declining, given the interdisciplinary nature of much contemporary research. It is a common practice for a particular faculty or research group to submit a research proposal, on the basis of which selection of potential candidates will take place. Owing to the increasingly programmatic nature of much university research, the aim is to link the research proposals of AiO participants with existing research programmes. However, it is possible for an AiO participant to write his or her own research proposal, which has to be approved by the selection committee or interest a professor who is prepared to further coach the candidate according to individual interests.

An open selection system exists, by means of which both graduates from given institutions as well as candidates from elsewhere can apply. However, the mobility of graduates from one university to another is traditionally rather low. This staying-in-place is encouraged because in certain subject fields students who, during their Master's degree studies, were involved in research or were attracted to particular research topics, may have developed an interest in continuing their research in a Doctoral programme. At the same time, academic staff members will scout potential

talents and consider whether or not they have the qualifications for a research traineeship. Increasingly, however, research schools recruit actively from among graduates of other universities as well as from among foreign graduates of the given university in order to develop a strong international scientific community.

The legal regulations for Doctoral studies are not very detailed. Apart from the rule that every research trainee should have a training and supervision plan, the *Higher Education Law* only provides a general framework for obtaining the Doctoral degree. More detailed matters are at the discretion of the individual university, which, for this purpose, has drawn up a set of regulations for the Doctoral degree.

According to the Law, candidates eligible to be awarded a Doctorate are those who:

- i.* have passed the final examination of the first university degree (equivalent to the Master's degree);
- ii.* have written a dissertation or have successfully conducted an experiment (mainly in the technical sciences);
- iii.* have met the requirements of the regulations for Doctorates.

The Law charges the Doctoral Board of each university to formulate a set of regulations for Doctorates and to award Doctoral degrees. In special cases, the Doctoral Board can admit someone to Doctoral studies who does not meet the requirement under (*i*).

For each Doctoral candidate, the Board assigns a professor as supervisor and appoints a committee made up of professors and other persons who are eligible on the basis of their abilities in the field concerned. The graduation ceremony consists of a public meeting in which the candidate presents and defends his or her dissertation before a Doctoral Board.

More detailed regulations regarding graduation ceremonies are formulated by each Doctoral Board. These are more or less standard across all Dutch universities. Some universities have further regulations regarding the undertaking of experiments (mainly the technical universities). Another difference is that at some universities the committee that decides on the dissertation is not the same committee that "reads" the dissertation, whereas, at other universities, these tasks are carried out by one and the same committee. But, generally speaking, universities do not differ much from one another in this respect.

Foreign Qualifications

Foreign students who seek admission to Doctoral studies must address a request to the Doctoral Board of the given university. Normally, the Board decides on the basis of recommendations by the Office of Student Services or the Dean of students with, eventually, certain additional findings from the department concerned. The Office of Student Services and the Dean of students consider the diploma of the candidate, including the Supplement.

They can, in their turn, consult the Netherlands Organization for International Co-operation in Higher Education (NUFFIC). If the outcome is positive, the candidate is admitted, a decision which, of course, becomes final when his or her dissertation topic is approved by the Doctoral Board.

Since for international students the necessary documents are often not available beforehand, most universities do not require that this procedure be completed before a candidate is admitted to the AiO-system. But it is considered desirable to complete the procedure in the first year of the AiO-appointment, so that additional requirements, if needed, can be included in the individual training plan.

The criteria for selection are creativity and independence, combined with teamwork and communicative skills, as well as scientific depth and thoroughness.

Quality Assurance Mechanisms

As portrayed in Table 3, the graduation rate of Doctoral trainees is 35 percent of the 1995 cohort after five years. This figure is generally considered to be a major concern, for a low success rate is a negative factor for universities, given that the numbers of graduates constitute a component for determining university research funding. Premiums are paid on the basis of the numbers of Doctorates awarded. For AiOs, it is unsatisfactory not to finish the Doctorate within the contractual period, since the financial consequences are serious.

Several research reports on this issue have pointed to various factors which explain this low percentage and which cause much delay or dropout among trainees (Van Hout *et al.*, 1996; Sonneveld, 1997; De Gier *et al.*, 2000; Van Vucht Tijssen, 2000; Meijer, 2002). Apart from personal aspects (such as family circumstances and few possibilities for part-time work) and material conditions (such as the relatively low remuneration compared to other segments of the labour market), the reports all point to the importance of process factors. These concern the conditions under which trainees have to work, the socio-cultural organization, mutual expectations, and supervision. Although all trainees have a legally required personal training and supervision plan, it does not provide a sufficient guarantee that the path towards the Doctoral degree will be smooth. There are many complaints that these plans do not have much concrete substance beyond the formal requirements and that the given organization is not adequately prepared to guide trainees according to a rather tight time-schedule.

The link between the quality of Doctoral training and the standard quality assurance mechanisms for university courses is rather weak. Doctoral training lies almost beyond the scope of the external quality committees, which assess the quality of education and research on a regular basis. The Doctoral training system emanates from an organizational culture in which the closed character of the master-apprentice relationship is a dominant feature. There are several problems

and potential situations of conflict, such as different views of the nature of research, the requirements of supervisors (some set very high standards; others view a PhD thesis as a first proof of scientific expertise), academic freedom, and publication procedures. Also, the views of research trainees themselves who want to do creative research and to write a *magnum opus* may be in contradiction with the requirements of work under strict time constraints.

In the research reports mentioned above, research trainees have regularly expressed their dissatisfaction with the limited time devoted to supervision and to the lack of coaching during the process. When the contact is experienced as minimal and trainees have to work in rather lonely environments, the situation has a negative effect on the motivation to persevere. Certain supervisors take the position that a *laissez-faire* vision is the best guarantee of independent and critical research, whereas others demand total compliance with the norms and standards set by the master. However, neither absolute freedom nor a straightjacket are considered beneficial to the process and the purpose of Doctoral education.

One aspect of the difficulties is that the supervisor is both coach, process coordinator, and the first person to approve the dissertation. Such a combination of tasks conceals inherent tensions. As Sonneveld states, “on the surface, there appears an idyllic picture characterized by harmony, mutual assistance, and inspired scientific exchange. Underneath, there is a layer of competition, uncertainties, disappointments, and controlled irritations” (Sonneveld, 1997). He goes on to argue that not all AiOs are able to develop what he calls a “patronage-relationship” with the supervisor. The central theme of such a relationship is the diminished intellectual freedom of action for AiOs. They have less freedom to determine their own dissertation subjects but must experience “indentured work”.

In the last few years, greater attention has been paid to the quality of Doctoral training. Recommendations for improving the quality of the process relate to regular evaluations, whereby progress as well as coaching and feedback mechanisms are reviewed along with the extent to which an open communicative working environment is achieved. In addition, there is some support for the idea that supervision should be carried out in the context of the personnel management of the faculty. Poor performance should therefore have consequences for the supervisor (Meijer, 2002).

Unlike what prevails in the standard AiO-system, the research schools are more subject to quality assessment procedures. As stated earlier, since the Royal Academy of Sciences is responsible for the recognition of research schools, this body has established an independent Evaluation Committee with the task of evaluating their performance (*Erkenningscommissie voor de Onderzoekscholen* – ECOS). As these schools also have an important training function for young researchers, the quality and transparency of their training and supervision and their attractiveness, capacity, and throughput are important criteria.

Several research schools have more strict evaluations, regular feedback moments, and monitoring of planning, and are offering courses which all

AiOs are supposed to take. Last but not least, in the case of supervision, often two persons are responsible, making this activity less dependent on individual arbitrariness (VSNU/Universiteit van Amsterdam, 2002).

The inclusion of AiOs in the research schools has increased the numbers of degrees awarded. Although the research schools have higher graduation rates than the overall mean, it is nevertheless believed that certain aspects of quality need to be improved. According to the Chairperson of the Evaluation Committee, too many research schools do not yet define the objectives of their Doctoral *curricula* in a sufficiently straightforward way. The Chairperson relates this deficiency to the ill-defined status of the Doctoral degree in contemporary Dutch society and to the fact that it has largely become a matter of intrinsic motivation on the part of the candidate (Michon, 2002). Similarly, KNAW has concluded in a recent report that, in particular, the supervision of Doctoral students leaves much to be desired. Therefore, the improvement of the quality of Doctoral training as well as the supervision of aspirant-researchers is a priority in increasing the capability of universities to attract and to recruit talented young researchers (KNAW, 2002). On the basis of these findings, the evaluation committee aims at refining the criteria for the recognition of research schools and to subject their scientific quality to a stricter regime, namely to evaluate their research outputs like those of universities.

The Future Employment of Doctoral Degree-Holders

From the start of the AiO-system in 1988, the benefits of academic promotion and entitlement to future employment have been high on the agenda. Is the purpose of the Doctorate to provide advanced scientific training for future researchers at universities, research institutes, and R&D functions in industry, or does it also offer employment outlets for a wider category of functions on the labour market? Clearly, the increase in the numbers of Doctorates is aimed at assuring future needs for qualified academic staff; however, it was stressed from the start that the AiO-system should be relevant for many generalist and specialist jobs outside academe. Doctoral education should not be solely associated with an academic career, but should be responsive to the demand for highly qualified personnel for a knowledge-based society. Most of the time, however, it has been taken for granted that the knowledge and skills, which are acquired during Doctoral training and which are of a specialist nature, are naturally utilizable in broader employment settings.

Some empirical research has investigated the assumption of the broader employability of Doctorate holders. The large-scale survey of PhDs on the labour market (Hulshof *et al.*, 1996) reveals that, of the graduates from among the first cohorts of the AiO-system, 38 percent was working in universities; 15 percent, in research institutes; 13 percent, in industry – thus a total of 66 percent. In addition, 8 percent was unemployed and the rest, 26 percent, was in non-academic employment.

For most research functions, a Doctoral degree is a necessary qualification, and for universities, the Doctoral degree has increasingly become a necessary step for an academic career. Regarding the knowledge and skills acquired in Doctoral training, those Doctorate holders who are in research indicate that both corresponded to the requirements of their subsequent employment. For those graduates who enter other, non-research functions, only 40 percent indicates that employment matches the degree-level. Also, these graduates are less satisfied with the extent to which the knowledge and skills acquired in Doctoral training are utilized in their jobs. Only 39 percent considers that its employment is linked to its Doctoral training.

Another finding from this survey is that having a Doctoral degree does not provide a salary advantage, as compared to graduates who only hold the first (Master's) degree. Even if a four-year Doctoral training is viewed as a period for gaining work experience and the incomes of those persons in such programmes are compared with those of first degree graduates who have already been employed for four years, the salary difference is negative for the holders of Doctorates (Hulshof *et al.*, 1996).

These findings indicate that the added-value of having a PhD for employment outside the area of research in universities, research institutes, and R&D functions in industry is rather limited. Having a PhD does not give the holder an advantage in employment conditions, in terms of salary and job security. For a larger group of PhD holders, the benefits and entitlements of their degrees are not required or desirable. Their rather specialized training and their strong preoccupation with academic activities can work against them. These findings, in a way, are reminiscent of the traditional view of Doctoral study, which as Boyer (1990) states, is all too often "a period of withdrawal - a time when many students are almost totally preoccupied with academic work".

Similar conclusions can be drawn from a project, "Young Scientists" (Jansen, 2002), which questions the added-value of the PhD on the labour market. This project concludes that many organizations (and even research organizations) have no preference for PhD holders above first degree (Master's) holders. The acquired knowledge and skills are viewed as being specialized and particularly relevant for scientific research within academe. Strong analytic skills and well-developed methodological abilities are recognized, but, in addition, social, communicative, and commercial skills are of essential importance for many functions. Since PhD holders still have to develop these skills, their degrees do not give them an advantage over other graduates. For this reason, much attention has been paid to the acquisition of competencies and generic skills in the Doctoral process which make the holders of Doctorates more attractive to employers. It should be stressed, however, that these findings do not lead to the conclusion that PhDs are not wanted on the labour market. Especially great value is attached to the expertise of Doctorate holders and to the fact that they have shown perseverance, an ability to work independently, and that, in general, they possess maturity.

Careers in Universities

Another observation is that most persons who have obtained employment in research after they had completed their Doctorates tend to move away from the university and adopt other types of work along their career paths. This trend may be linked to the fact that the proportion of Doctoral-degree holders working in universities is decreasing. This trend is undoubtedly due to the fact that, in the last decade, the career prospects in academe, after the award of a Doctorate, have become very limited, with few possibilities for tenure-track appointments.

AiOs have been the objects of several surveys which have revealed that the majority of them have a strong preference for continuing their research. Most individuals who accept an AiO position are interested in pursuing an academic career. At the same time, they judge their chances of being appointed to a faculty position as very low because of the few openings available (for an overview of these surveys, see Van Vucht Tijssen, 2000). It appears that those PhD awardees who remain in academe will obtain a post-Doctoral appointment. Although such an appointment can be a bridge between the Doctorate and a permanent position, most post-Doctoral student staff are caught in the squeeze of increased supply amidst declining opportunities. Most post-Doctoral staff members hold a series of two- or three-year contracts, becoming, in practice, non-tenure track staff (Crum and Bal, 1998).

Owing to the fact that the benefits of employment in universities are relatively low in financial terms and future prospects, the interest in obtaining an AiO-position has declined, especially in fields with high private sector demand. Institutional leaders and politicians have expressed concern about the declining attractiveness of the research system and the difficulty in retaining young researchers. This dilemma is crucial, because a large portion of the permanent academic faculty in the Netherlands will retire within the next five years.

A national committee, which was charged with developing policies to deal with these problems, indicated that the combination of retirements and declining AiO participation will result in a shortfall of 2,886 full-time faculty by 2008, about 12 percent of all faculty in the Netherlands. Shortages are forecast for all functional categories, especially among associate and assistant professors. The committee report urged new policies to encourage Doctoral enrollment before the influx of talent becomes too small to fill needed positions (Van Vucht Tijssen, 2000).

Several initiatives have been taken to retain young promising academics for universities. Certain universities are offering higher salaries to trainees, particularly in subject areas with projected faculty shortages, such as engineering. Other fields have introduced new types of appointments, such as tenure-track appointments and junior professorships. The *Anthony van Leeuwenhoek* chairs, founded at the Technological University of Delft, are an example.

Another initiative has been taken to encourage potential academics to stay in their universities to fill future faculty vacancies by extending temporary research contracts with the stipulation that the university guarantee a permanent position thereafter. In addition, government, Research Councils and universities have jointly made funds available to enable a select group of young researchers to carry out innovative research programmes. This so-called "innovation impulse" was originally intended for young researchers (mainly in post-Doctoral positions), but currently, all academic staff positions are eligible. Another government initiative is that of funding promising scholars specifically for positions in which the incumbent professor will retire in a few years. This temporary double staffing is intended to ensure that a replacement is ready when the senior professor retires.

Although the number of places available is quite limited, these examples illustrate the Dutch way of improving the careers of young people in the profession through financial incentives. Another strategy is to develop genuine tenure-tracks, providing career paths based on concrete career steps. This approach requires that the distinction between tenured and temporary positions and the rigidities between them be considered. In order to diminish those rigidities, a proposal has been made to establish more varied faculty career paths and a less sharp demarcation between tenured and temporary staff by linking tenure to regular assessment procedures (de Weert and Van Vucht Tijssen, 1999).

5. TRENDS AND CHALLENGES

Since the establishment of the AiO-system and research schools in the Netherlands, Doctoral training has evolved from a rather loose system towards a more structured system. This system tends to be moving in a certain direction which, however, is surrounded with certain controversies. Some of the prevailing trends and challenges about the future conception of Doctoral education are detailed below.

Doctoral Programmes: Training or Education?

From its start, the AiO system has focused predominantly on the training aspect of future researchers. Research trainees are supposed to carry out their research according to an original project outline, which results in the successful defense of a dissertation. They usually have a small fund that they can spend to take courses elsewhere or to attend scientific conferences to meet colleagues in the subject field, but this aspect is mostly left to individual decisions.

The last few years have revealed a tendency to develop more structured courses that AiOs in a particular field are able to take. On some occasions, these courses are compulsory. Although training and education are by no means opposites, a shift is notable from research training towards Doctoral education. Perhaps it is better to say that education increasingly constitutes a substantive component of the research training system. How

this trend will develop is an open question; however, it is clear that the research schools are increasingly playing a dominant role in this debate.

The Royal Academy of Sciences and Arts is advocating that research schools have a structured educational programme that should be mandatory for all Doctoral students. What is involved is (i) a structured programme for courses and supervision and (ii) general and subject-related courses linked to Master's degree seminars and classes. This *curriculum* should take into account the multidisciplinary collaboration, which the functions of research require both within and outside the university, as well as the requirements of jobs outside science. According to KNAW, future employers expect Doctorate holders to have a broad orientation as well as disciplinary depth. In other words, the educational part of the Doctorate should prepare Doctoral-degree holders both for functions within universities, research institutes, and R&D functions in industry, as well as for other functions in a variety of societal organizations (KNAW, 2000; 2002). Also the universities themselves have emphasized the "educational aspect" within the Doctorate (VSNU, 2002).

An important challenge will be to provide a course programme which combines both the objective to prepare students to become the next generation of scientists and that of preparing them for other career destinations. The course programme will be subject to quality assurance procedures and accreditation that will assess the extent to which both objectives have been accomplished.

The Hybrid Character of the Dutch Doctoral System

The Dutch Doctoral system exemplifies the hybrid character of Doctoral education, namely a combination of a status as student and as an employee. Since the AiO-system came into being, this characteristic has been experienced as a problem. Owing to intense pressures and to the policy to increase the attractiveness of research traineeships, many universities have offered increasingly competitive employment conditions for AiOs, especially in fields in high demand. In the collective labour agreement of 2003, the salaries of all AiOs increased substantially, whereas the remaining academic personnel registered more modest salary increases. According to the new salary structure, AiO-salaries will climb in three steps towards a normal salary scale. This evolution acknowledges the fact that AiOs are important (and relatively cheap) employees for universities, in financial hard times, and particularly the fact that AiOs provide a large amount of scientific output. Without the work of AiOs, the research output of universities would decline substantially.

This development implies that the hybrid character of AiOs is slowly moving away from student status to that of a "normalization" of the employment status. In such a conception, Doctoral degrees are less regarded as a final period of studies and more as a first period of academic work and employment. It remains to be seen whether or not this evolution will have implications for the numbers of AiOs and whether or not

universities will reconsider their personnel policies both with regard to temporary post-Doctoral positions as well as to tenured faculty positions.

Uniformity or Diversity?

Although the content and the character of Doctoral education is much focused on the completion of degrees and the creation of the next generation of scholars, there is a tendency to move away from the idea of promotion as such and to design the Doctoral process to meet social demand for highly educated professionals. Doctoral education should reflect different career destinations including the need to incorporate training components which make graduates employable in a variety of employment and professional contexts. Employable skills, such as research management skills, leadership, and organizational abilities have been mentioned in this context (VSNU, 2002).

Apart from this growing attention to the employability of Doctoral-degree holders, two other trends, which are leading to the diversification of Doctoral programmes, can be mentioned.

First, collaborative arrangements between universities and industry have been established, aiming at incorporating technological research into industry as a component of postgraduate training. Most often, these arrangements involve co-operative systems of Doctoral education by which students alternate their research and their professional work in industry with more formal training at universities. A recent initiative has been the establishment of a new research school, named "Applied Sciences", which, in alliance with the Association of the Dutch Chemical Industry, enables graduates with a first degree in Chemistry, Information Sciences, Physics, or Biology and with some years of working experience to earn a Doctorate. Also, in other professional fields, arrangements between universities and organizations in the sphere of the public services have been established with the objective of developing Doctoral programmes on a joint basis.

Second, there is a tendency to integrate several types of postgraduate courses which fall somewhere between the first degree and the PhD and are more in line with Doctoral education. For example, the Design course for engineers takes two years. In their first year, students take courses and are paid on a basis similar to that of AiOs. During the second year, they work for a firm as apprentices. The idea is to make this Design course be more in tune with the requirements of Doctoral education by extending the course an extra year and by adopting research that meets the requirements for obtaining the Doctoral degree (the dissertation and/or an experimental design).

These trends display more variance in Doctoral education, which is not solely oriented to fundamental research as such, but which includes those activities that are close to professional practice and research that take place in the context of application. As Rip states, Doctoral research training is becoming more diversified in terms of its content and location. "For universities, the key challenge is to diversify and recombine, both

cognitively and institutionally, into a post-modern university which includes overlaps and alliances with centers of excellence, public labs, and various private organizations” (Rip, 2002).

This diversification of content and localization of the Doctorate poses questions as to status, purposes, and quality of Doctoral education. The question is how to guarantee that these various forms of Doctoral training will continue to produce excellent research. The quality control criteria in different contexts – an environment of pure academic research and practical problem settings – can diverge to a large extent. As Birrer (2001) notes, a particular claim may be reliable for practical application, while not standing up to scientific scrutiny. It should be stressed, however, that although in all these cases there is a shared responsibility for the process, the universities are at the center of quality control since they remain responsible for the product.

Doctoral Training and the Bachelor's and Master's Degrees

The implementation of the Bachelor's/Master's degree structure in Dutch higher education has stimulated many debates on the position of Doctoral education. The NWO Research Councils, the affiliated research institutes, and the Royal Academy of Sciences and Arts advocate a more integral conception of university education, whereby the research-oriented Master's and Doctoral education should be linked closely. These bodies attribute the research school a “pivotal function” in achieving such integration. During the Master's phase, courses should prepare students for the Doctoral programme, for example, in a 3+2+3 or in the current 3+1+4 model.* It is argued that newly awarded Master's degree holders will meet the requirements for enrollment in the Doctoral programme and will subsequently affect the graduation rates of Doctoral-degree holders positively. Another advantage is that research schools can scout and attract young research talent at an early phase.

The universities themselves manifest an increasingly ambivalent attitude, for they are not eager to attribute such a central role to the research schools. In their view, the research schools should not be the guiding principle for the organization of university research. They are in favour of considering alternative options as well (Moen, 2002).

The International Context

The last trend that needs to be mentioned is the international orientation of Doctoral education. Universities increasingly cater to the international market, and a growing percentage of their graduate students are from Asian and East European countries. The numbers of foreign students have

* Already in the Sciences and in Engineering, over the last year (2003), the model of the four-year *doctorandus* has been extended to five years. Under the new Bachelor's-Master's structure, the trend is for 3+1 for professional Master's degrees and 3+2 for research Master's degrees, not only in the Sciences and Engineering but also on other disciplines.

increased in the last few years, and some faculties, mainly those in the technical sciences, attract up to 50 percent of their Doctoral students from abroad.

This development has been dictated by shortages of Dutch candidates, but increasingly because of the policy to broaden the expertise and to stimulate the mobility of researchers. The aim of developing Doctoral education, which is internationally competitive, is an important asset since it creates, and, respectively, reinforces the international scientific community and the international position of Dutch scientific research. According to this view, Doctoral education and the institutional context in which it is embedded should play a central role in the European Research and Innovation Area. As such, Doctoral education becomes interwoven with science policy which focuses on the allocation and the concentration of research programmes in centers of excellence. The president of the Dutch Research Council supports a further mixture of national and international research programmes whereby national programmes will gradually be accessible from other countries. In this context, he advocated for the establishment of a European Research Council (Nijkamp, 2002) which, in his view, should designate the best European research universities and should stimulate top quality research. In this development, Doctoral education becomes deeply embedded in the emerging international research system.

6. CONCLUSION

Doctoral education in the Netherlands has gradually developed into a more structured training system. The key feature has been to bring together the various aspects and capacities of Doctoral education into a single location and to frame the results into comprehensive educational and research programmes.

New trends are emerging, which, in their turn, are leading to new debates and perspectives for the future. Some persons are advocating a limitation in the numbers of research schools through the mechanism of severe selection criteria for aspiring researchers and high quality standards through a system of quality assessment and rigorous accreditation. Critics have argued that such proceedings would restrict innovative research that is risky and would tend to reduce the accommodation of young researchers with critical and independent spirits. At the same time, international developments, such as the implementation of the Bachelor's degree/Master's degree structure and the international dimensions of scientific research policies, are affecting the further shaping of Doctoral education in the Netherlands.

At the same time, there is increased diversity in the ways in which Doctoral education is being shaped. There is growing attention to employable skills and competencies in Doctoral programmes. Collaboration among universities and private as well as public organizations to establish Doctoral programmes on a joint basis has

intensified. This trend may increase the qualifications of Doctoral-degree holders working outside the sphere of academic work. These developments shed a new light on Doctoral education and reflect a balance between the design of a uniform structure and the facilitation of more diversified forms.

BIBLIOGRAPHICAL REFERENCES

- BARTELSE, J. A., DE BOER, H., HUISMAN, J., and LUGTHART, E. *De onderzoekschool. Een analyse van het functioneren van het beleidsinstrument onderzoekschool*. Zoetermeer: Ministerie van Onderwijs, Cultuur en Wetenschappen, 2001.
- BIRRER, F. A. J. "Combination, Hybridisation and Fusion of Knowledge Modes", in, G. BENDER, ed. *Neue Formen der Wissenserzeugung*. Frankfurt and New York: Campus Verlag, 2001, pp. 57-70.
- BLUME, S. S., DIJSTELBLOEM, H., SPAAPEN, J. B., and WAMELINK, F. J. M. *Balans en flexibiliteit. De functie van onderzoekscholen in het universitaire bestel: opleiding, onderzoek en organisatie*. Zoetermeer: Ministerie van Onderwijs, Cultuur en Wetenschappen, 2000.
- BOYER, E. *Scholarship Reconsidered: Priorities of the Professoriate*. Princeton: The Carnegie Foundation for the Advancement of Teaching, 1990.
- CRUM, M., and BAL, J. *Werk- en loopbaanpositie van postdocs*. Leiden: Research voor Beleid, 1998.
- DE GIER, E., EVERS, P., DE JONG, L., and STERCKX, L. *Wetenschap tussen roeping en beroep*. Amsterdam: SISWO, Instituut voor Maatschappijwetenschappen, 2000.
- DE WEERT, E., and VAN VUCHT TIJSSSEN, B. E. "Academic Staff between Threat and Opportunity: Changing Employment and Conditions of Service", in, B. JONGBLOED, P. MAASSEN, and G. NEAVE, eds. *From the Eye of the Storm: Higher Education's Changing Institution*. Dordrecht: Kluwer Academic Publishers, 1999, pp. 39-63.
- HULSHOF, M., VERRIJT, A., and KRULJTHOFF, A. *Promoveren en de arbeidsmarkt: ervaringen van de "lost generation"*. Nijmegen: IOWO-KU, 1996.
- JANSEN, N. *Jonge wetenschappers: competent talent?* Utrecht: VSNU, 2002.
- MEIJER, M. M. *Behoud talent!* Utrecht: Landelijk AiO en OiO Overleg (LAIOO), 2002.
- MICHON, J. "Accreditation of Research Schools in the Netherlands", Proceedings of the Workshop on "Science, Training, and Career – Changing Modes of Knowledge Production and Labour Markets", Enchede, CHEPS, University of Twente, 21-22 October, 2002.
- MOEN, C. "Over de toekomst van de onderzoekersopleiding", in, TH&MA 1 (2002): 42-46.
- NIJKAMP, P. "Ramen open", *De Volkskrant* (6 April 2002).
- RIP, A. "Post-Modern Universities and Research Training", Paper presented at the workshop, "Science, Training, and Career – Changing Modes of

- Knowledge Production and Labour Markets". Enchede, CHEPS, University of Twente, 21-22 October 2002.
- ROYAL NETHERLANDS ACADEMY OF ARTS AND SCIENCES – KNAW. *Rijzende sterren. Om de kwaliteit van de onderzoekersopleiding*. Amsterdam: KNAW, 2000.
- ROYAL NETHERLANDS ACADEMY OF ARTS AND SCIENCES – KNAW. *Grenzeloze wetenschap. Enkele gedachten over onderzoekersopleidingen en de bekostiging van universitair onderzoek*. Amsterdam: KNAW, 2002.
- SONNEVELD, H. *Promotoren, promovendi en de academische selectie. De collectivisering van het Nederlandse promotiestelsel*. Amsterdam: University Press, 1997.
- VAN HOUT, J. F. M. J. *Onderzoekers in opleiding*. Nijmegen: Instituut voor Onderzoek van het Wetenschappelijk Onderwijs, 1988.
- VAN HOUT, J. F. M. J., HULSHOF, M. J. F., and JURGENS, H. J. H. *De opleiding van onderzoekers: een evaluatie-onderzoek naar het functioneren van het AiO-stelsel*. Zoetermeer: Ministry of Education, Culture, and Science, 1996.
- VAN VUCHT TIJSSEN, B. E. *Talent voor de Toekomst. Toekomst voor Talent*. Zoetermeer: Ministry of Education, Culture, and Science, 2000.
- VSNU/UNIVERSITEIT VAN AMSTERDAM. "Beter promoveren: uitwisseling van best practices". *Verslag van een themadag* (11 October, 2002).
- VSNU. *Kengetallen Universitair Onderzoek (KUOZ)*. Utrecht: VSNU, various years.
- VSNU. *Wetenschapspersoneelsinformatie (WOPI)*. Utrecht: VSNU, 1990-2002.

VI. Norway

INGVILD BROCH and BERIT HYLLSETH

Two major events should be kept in mind when considering Doctoral degrees and qualifications in Norway, given that the system by which they are earned and awarded is in transition. First, the Norwegian system of higher education is, at present, undergoing a reform, the so-called Quality Reform, in order to achieve improved quality in higher education and research and to conform to the stipulations of the Bologna Process and the obligations incumbent on Norway. The reform concerns both the public and the private higher education institutions. Some of its main elements are a new degree structure, new forms of student guidance, evaluation, and assessment, and internationalization. Second, in 2001-2002, an "Evaluation of Norwegian Training of Researchers" took place. The evaluation had been ordered because there were obvious problems with Doctoral training in Norway. The results of this evaluation had implications for the development of Doctoral education.

This study will discuss both events. As Norwegian Doctoral education is in a period of transition, the system described herein is, therefore, new and still relatively untested.

1. SYSTEM OF DOCTORAL DEGREES

Until 1993, in Norway, the Doctoral degree was not regarded as a formal part of the educational system. New research recruits received some research training as part of the process of earning their higher degrees and additional training in positions as fellows or as research assistants. The typical higher degree in the traditional system was the *Dr. philos.*, comparable to the higher degree in other more specialized fields of research: *Dr. med.*, *Dr. med. vet.*, *Dr. theol.*, and *Dr. juris*. A Doctoral dissertation was regarded more as a masterpiece than as an apprenticeship dissertation. Consequently, candidates were normally well past the age of 30 when they were awarded their Doctorates.

Traditionally, Norway had two university degrees in most subject areas: a first degree awarded after four to five years (*Cand. mag.*) and a higher degree awarded after a further two to three years (*Cand. philol.*, *Cand. scient.*, *Cand. polit.*, etc.), which included the writing of a dissertation. In 2003, as a result of the reform of higher education, a new, internationally compatible, degree system was introduced in accordance with the stipulations of the Bologna Declaration consisting of the Bachelor's degree, awarded after three years of study, and the Master's degree, after a further period of two years of study.

During the 1970s and 1980s, structured programmes leading to Doctoral degrees proceeded and were introduced, but without specific

coordination, at national level. Several new Doctoral degrees were established in order to provide more structured research training.

The Norwegian Institute of Technology led the way in 1974, when it introduced the *Dr. ing.* degree. In 1977, a corresponding degree (*Dr. scient.*) was introduced in the Natural Sciences, to be followed in the 1980s and early 1990s by new degrees in the Social Sciences (*Dr. polit.*) and the Humanities (*Dr. art.*).

However, the traditional system still retained several disadvantages. First, the Norwegian research training period was extremely long, as compared to that in most other countries, and the requirements for a Candidate dissertation were relatively comprehensive. Secondly, relatively few of those who were appointed as research fellows or as research assistants actually presented a Doctoral dissertation. Many scholars also found it problematic that the academic qualifications obtained by Norwegian researchers were not sufficiently recognized within an international context, and many were critical of the relatively narrow specializations that were frequently the outcome of this training model.

In 1991, for these reasons, the Norwegian Council of Universities took upon itself the responsibility for coordinating research training. By the following year, the Council members had reached a solution through the Research Training Committee of the Council on a joint agreement for organized research training. The Ministry of Education and Research had already determined that the new field-specific Doctoral degrees should be based on a three-year norm. Doctoral students could either apply for a stipend for three years of full-time research, or for four years including a mandatory 25 percent workload for the institution, preferably in the area of teaching responsibilities. In addition, an agreement was to be worked out between the university department and the individual student, concerning working conditions, supervision, course participation, etc.

In 1993, the Norwegian Council of Universities presented common national regulations pertaining to organized Doctoral studies. This action marked the end of a reform process that had been underway for more than twenty years.

The introduction of organized research training had several objectives:

- to enable a large number of scholarship holders and researchers to earn Doctoral degrees;
- to reduce the period of research leading to the Doctorate;
- to broaden the academic content of research training through the introduction of courses;
- to improve the supervision of the writing of the dissertation;
- to make Norwegian research training more compatible with that of leading foreign systems, particularly, the Anglo-American system of Doctoral education;
- to meet the requirements for staff holding a Doctorate both within and outside academe.

Since 1993, national Doctoral degree regulations, based on structured courses and certification, have been introduced at all university-level institutions. The new Doctoral degrees are based on formal research training with structured courses. A degree corresponding to the PhD level at a well-recognized – preferably American or British – university is the objective. Normally a higher degree is required of those who intend to enter a Doctoral programme.

Today, Norway has two kinds of Doctoral degrees: the traditional degree of *Dr. philos.*, which is retained as an alternative for those who do not take part in Doctoral training programmes, and the new formalized Doctoral degrees. As a result of the higher education reform implemented in 2003, the PhD degree will, hereafter, replace the eleven specific subject-related Doctoral degree designations, while the *Dr. philos.* will continue to exist as an alternative to organized Doctoral training.

The PhD model, which is the basis for the new degrees, emphasizes structured research training with dissertation supervision and requirements for participation. In 1993, as already mentioned, joint national regulations prescribing a given length of study were introduced for all Doctoral degrees. The norm is three years of study and research on a full-time basis, preferably distributed over four years, with 25 percent of the working time to be devoted to university service. Joint national contracts have also been established, *i.e.*, admission and supervision contracts for the institutions, as well as contracts between Doctoral degree-granting institutions and external research institutes. The purpose of these contracts is to ensure that candidates are given good working conditions and qualified supervision, and that they, in turn, are to complete their studies in a prescribed time interval. These regulations pertain to all fields of learning. The goal is to improve research training in such a way that more students will be able to complete their Doctoral studies and obtain Doctoral degrees in a shorter period of time.

Organized research training is financed mostly by research fellowships, funded either through the budgets of the individual educational institutions or by the Research Council of Norway. The duration of a fellowship is three to four years, depending on its source. Fellowships are intended to facilitate the full concentration of Doctoral students on their dissertations and their studies. Most Doctoral students receive fellowships that pay them regular salaries, comparable to the salary levels available in the public sector.

Towards the end of the 1990s, there were indications that Norway had not yet fully succeeded in its aim to create viable research environments for graduate research training. In this respect, however, there were great differences among disciplines and among university departments. The Technical and the Natural Sciences and the Medical fields are generally better off than the Humanities and the Social Sciences. Some departments are large and may offer stimulating environments for teaching and research, while others are small and not capable of covering the breadth of knowledge necessary for the education of well-qualified Doctoral

candidates. A broad overview shows that Norway still has a long way to go before meeting the objectives of good Doctoral training.

In 2002, on the basis of the objectives mentioned above, an International Panel supported by the Norwegian Institute for Studies in Research and Higher Education (NIFU) conducted an evaluation of the training of researchers in Norway. The evaluation was initiated by the Norwegian Council for Higher Education (UHR) (that is, the former Norwegian Council of Universities that, as of 2002, also includes the university colleges) in co-operation with the Research Council of Norway and the Ministry of Education and Research.

Some of the main conclusions of the Evaluation Panel are presented below. Norwegian research training and, particularly, Norwegian Doctoral dissertations are generally good when measured against international standards. However, the Panel pointed to a number of special factors in the Norwegian educational and research training system, which contribute to this good level:

- A Doctoral dissertation is still understood to be more of a masterpiece than an apprenticeship thesis. The *Dr. philos.* tradition lives on, particularly in the Humanities and the Social and Natural Sciences. In these fields, Norway has not yet fully implemented a modern research training system.
- Compared to what prevails in most other countries, Norwegian Doctoral students in the Humanities and the Social and Natural Sciences have had considerable preliminary research training and experience prior to commencing their research training. In the Humanities and the Social Sciences, students are notably older when commencing these Doctoral studies than in other countries.
- Doctoral students usually require a long period to complete their dissertations.
- Again, compared to what prevails in other countries, Norwegian Doctoral students in the Humanities, the Social Sciences, and Medicine/Odontology are relatively old when awarded their Doctorates.

The Evaluation Panel emphasized that efficiency in research training should be included as a part of the total evaluation of quality. One main problem is that students, in general, are relatively old when they submit their dissertations, a situation applying particularly to the Humanities, the Social Sciences, Medicine, and Odontology.

The Evaluation Panel also considered that the prevalence of the *Dr. philos.* tradition has been an obstacle to a sweeping reform of Norwegian research training. The academic standard of this traditional degree still influences the norm for the scope of new theses. Also, the existence of the *Dr. philos.* has enabled Doctoral students to avoid taking part in organized training programmes while nevertheless being able to be awarded a Doctoral degree.

The main recommendations of the Panel are the following:

- the setting up of graduate schools;
- new regulations that emphasize the links of students with supervisors and research groups;
- a new degree system;
- emphasis on supervision and helping students to be part of an academic community.

The universities, the Research Council of Norway, and the Ministry of Education and Research are all involved in the follow-up to the evaluation. The Research Committee of the Council of Higher Education has drafted a report on Doctoral schools, which has been presented to the Ministry and to the Research Council. The Council of Higher Education has also adopted new regulations for Doctoral studies (*Veiledende bestemmelser for PhD graden*). The Research Committee of the Council will now review all standard agreements between PhD students, university departments, etc.

There is one national system of Doctoral training with common national regulations. The individual institutions of higher education, do, however, have somewhat different goals. Consequently, Doctoral programmes, are offered by all university-level institutions (*i.e.*, universities, specialized university institutions), some university colleges, and a few private institutions.

Apart from teaching, the four universities and the six specialized university institutions have a particular responsibility for the training of researchers through Doctoral programmes. Universities can establish Doctoral programmes and award degrees in all academic fields in which they offer instruction.

Norway has twenty-six university colleges. The aim of the State university colleges is to make higher education more widely available while increasing the level of academic expertise available to the different regions of the country. The twenty-six colleges primarily offer shorter courses of a more vocational orientation than those offered by the universities. In addition to teacher training and courses in Engineering, Health and Social Work, and other vocational areas, the colleges offer undergraduate courses interchangeable with those offered by the universities. Traditionally, college courses have had durations of two to four years. The reform of higher education has also led to changes in the college degree structure as of the autumn of 2003, with the introduction of a first degree that is earned in three years (Bachelor's degree) and a graduate degree earned in two years (Master's degree). So far, in 2003, four colleges have been given the right to award Doctoral degrees within specific disciplines.

In addition, there are two national university colleges of the arts and some twenty-five private institutions with recognized higher education study programmes receiving state funding. There are approximately 200,000 registered students in Norway, including 20,000 at private higher education institutions.

As a result of the Quality Reform, higher education institutions now have significantly greater autonomy in managing and organizing their

activities than in the past. Universities and colleges have increased institutional autonomy in terms of introducing and eliminating courses and study programmes, of offering subjects and subject combinations, and in determining the requirements to be met for the award of their degrees.

The two Academies of Sciences (Oslo and Trondheim) are not research institutions and do not have a role in Doctoral education.

There are, however, many research institutes, mainly within the Technological, the Medical, and the Social Sciences. These institutions do not have an independent role in Doctoral education, but research associates in these institutes can be admitted to organize research training in the universities. The relevant institute and university department must then sign an agreement guaranteeing that the Doctoral student will have the necessary time to obtain a Doctoral degree within a reasonable time interval.

As a result of the recent reform, all higher education institutions are expected to ensure provision of high quality education. Since January 2003, an independent national agency for the accreditation and evaluation of higher education in Norway (Norwegian Agency for Quality Assurance in Education - NOKUT) has been responsible for assessing the quality of programmes and institutions. The agency has accreditation powers in regard to all higher education in Norway and acts as the Norwegian ENIC-NARIC Center. The terms of reference of NOKUT are the following:

- It assesses the quality assurance systems of the higher education institutions.
- It accredits the private higher education institutions as well as institutions requesting a change of status (from the status of a university college to that of a university).
- It accredits academic courses, when doing so is not within the authority of the individual institution.
- It monitors and reviews accreditation that has already been granted.
- It assesses the overall quality of Norwegian higher education in an international context.

The Agency also plays an advisory role for the Norwegian higher education institutions regarding the recognition of foreign degrees and the transfer of credits according to internationally accepted and ratified principles, e.g. the Lisbon Convention.

2. QUANTITATIVE TRENDS

Altogether, almost 700 Doctorates are awarded each year, of which the *Dr. philos.* accounts for between 10 and 15 percent.

The following tables present a brief overview of certain major trends in Doctoral education in Norway.

First, one can observe a noticeable increase in the 1990s, with the numbers of degrees awarded yearly almost doubling from 1990 to 2002 and almost quadrupling from 1980 to 2002.

Table 1. Doctoral degrees by type of discipline (in numbers)

Title	1980	1990	1995	2000	2002	1980-2002
<i>Dr. philos.</i>	52	61	90	67	107	1,627
<i>Dr. med.</i>	42	73	113	94	77	1,625
<i>Dr. juris</i>	1	2	6	9	6	97
<i>Dr. theol.</i>	1	5	1	4	4	79
<i>Dr. techn.</i>	1	6	-	2	2	58
<i>Dr. odont.</i>	10	4	8	5	5	137
<i>Dr. med.vet.</i>	4	3	1	8	7	70
<i>Dr. agric.</i>	4	-	2	4	3	48
<i>Dr. oecon.</i>	1	14	12	13	13	167
<i>Dr. ing.</i>	57	91	131	132	150	2,105
<i>Dr. scient.</i>	14	120	169	197	217	2,930
<i>Dr. artium</i>	..	1	23	44	62	387
<i>Dr. polit.</i>	..	10	39	58	73	501
<i>Dr. psychol.</i>	..	3	7	9	12	73
<i>Ph.D.</i>	..	..	..	..	1	1
Total	187	393	602	646	739	9,905

Source: NIFU (2002).

Universities award most of the degrees. The two private institutions – the Norwegian Lutheran School of Theology and the Norwegian School of Management – authorized to award Doctoral degrees, represent a minor part of the total.

Table 2. Calculated percentage of students continuing with Doctoral studies as a proportion of all students having completed undergraduate studies, by field of study

Field of study/Type of degree	Higher degree candidates. Year average 1995 - 1999	New Doctoral students. Year average 1998 - 2000	Calculated proportion of students going on to the Doctoral degree
Humanities/ <i>Dr. art</i>	784	85	11
Social Sciences/ <i>Dr. polit.</i>	833	108	13
Economics and Business Adm./ <i>Dr. oecon</i>	694	30	4
Natural Sciences/ <i>Dr. scient.</i>	911	220	24
Agriculture and Veterinary Science/ <i>Dr. scient</i>	252	39	15
Technology/ <i>Dr .ing</i>	1,565	153	10
Medical Science/ <i>Dr. med.</i>	453	76	17
Odontology/ <i>Dr. odont.</i>	90	9	10

Source: NIFU (2002).

Most of the degrees are awarded within the Natural Sciences, the Medical Sciences, and Technology. When Agriculture and Veterinary Science are included, these fields account for almost 75 percent of the total numbers.

In 2000, there were 5,000 Doctoral students in Norway, of whom 2,000 were women, corresponding to 40 percent of the total. Women currently account for half of the Doctoral students in the Humanities, the Social Sciences, Medicine, and the Agricultural/Veterinary Sciences. In Technology, in which women account for only 19 percent of the Doctoral students, a notable exception in the trend towards a balance between the sexes among Doctoral students can be observed. By comparison to the other academic fields, the growth in numbers of women as Doctoral students in Technology leveled off in the early 1990s.

Women are still underrepresented in most fields, notably in Technology and the Natural Sciences, while they seem, particularly, to be catching up in Medicine.

Table 3. Awarded Doctoral degrees by type of institution (in numbers)

Institution	1980	1990	1995	2000	2002	1980-2002
University of Oslo	72	124	192	232	231	3,483
University of Bergen	24	75	136	114	158	1,818
Norwegian University of Science and Technology (NTNU)	65	127	173	187	203	2,862
University of Tromsø	9	16	45	51	55	675
Total universities	170	342	546	584	647	8,838
Agricultural University of Norway (NLH)	12	20	27	31	55	566
Norwegian School of Veterinary Science (NVH)	4	15	14	8	15	250
Norwegian School of Economics and Business Administration (NHH)	1	14	12	12	11	161
Norwegian University of Sport Sciences	..	2	1	4	1	37
Oslo School of Architecture	-	-	1	3	3	18
Norwegian Academy of Music	..	..	..	..	1	1
Norwegian Lutheran School of Theology	..	-	1	2	2	24
Norwegian School of Management BI	..	..	..	1	2	6
Stavanger University College	..	..	..	1	2	4
Total specialized higher education institutions and state university colleges	17	51	56	62	92	1,067
Total	187	393	602	646	739	9,905

Note: Where figures are not available, the indication (..) is used. When there is no occurrence, the indication (-) is used.

Source: NIFU (2002).

Table 4. Awarded Doctoral degrees by field of study (in numbers)

Field of study	1980	1990	1995	2000	1980-2002
Humanities	18	21	46	67	862
Social Sciences	9	43	95	117	1,371
Natural Sciences	27	109	146	171	2,548
Technology	58	96	123	124	2,030
Medical Science	59	90	151	135	2,320
Agriculture and Veterinary Science	16	34	41	32	774
All fields	187	393	602	646	9,905

Source: NIFU (2002).

Table 5. Doctoral students by field of study – men and women (in numbers)

Field of study/Type of degree	NTNU	University of Bergen	University of Oslo	University of Tromsø	All universities
Humanities/ <i>Dr. art</i>	152	133	162	43	490
Social Sciences/ <i>Dr. polit./Dr. oecon</i>	252	162	283	119	816
Natural Sciences/ <i>Dr. scient.</i>	485	278	397	92	1,252
Agriculture and Veterinary Science/ <i>Dr. scient.</i>				58*	58
Technology/ <i>Dr. ing</i>	315				315
Medical Science/ <i>Dr. med.</i>	75	167	385	109	736
Odontology/ <i>Dr. odont.</i>		22	23		43
	1,279	1,250	763	421	3,712
Number of Women as Doctoral students	432	625	339	220	1,616

* Norwegian College of Fishery Science (a faculty at the University of Tromsø).

Source: NIFU (2002).

Table 6. Doctoral degrees by field and sex of participants (in numbers)

Field of study/ Sex of participants	1980	1990	1995	2000	2002	1980- 2002
HUMANITIES						
Women	5	10	18	29	39	341
Men	13	11	28	38	47	521
ALL	18	21	46	67	86	862
SOCIAL SCIENCES						
Women	1	8	28	44	64	457
Men	8	35	67	73	68	914
ALL	9	43	95	117	132	1,371
NATURAL SCIENCES						
Women	1	19	40	58	66	694
Men	26	90	106	113	105	1,854
ALL	27	109	146	171	171	2,548
TECHNOLOGY						
Women	1	2	26	17	22	271
Men	57	94	97	107	113	1,759
ALL	58	96	123	124	135	2,030
MEDICAL SCIENCE						
Women	10	18	58	66	77	700
Men	49	72	93	69	77	1,620
ALL	59	90	151	135	154	2,320
AGRICULTURE AND VETERINARY SCIENCE						
Women	1	8	18	12	28	246
Men	15	26	23	20	33	528
Men	16	34	41	32	61	774
ALL						
Total	287	393	602	646	739	9,905

Source: NIFU (2002).

3. DOCTORAL DEGREES AWARDED IN NORWAY AND IN THE OTHER NORDIC COUNTRIES

In the Nordic countries, approximately 5,000 persons are awarded Doctoral degrees annually. For the region as a whole, the annual numbers of Doctoral degrees have more than doubled, from 2,389 degrees awarded in 1990, to 4,983 degrees, in 2000.

Thus, the numbers of personnel having undergone research training, in the Nordic countries, have considerably increased. From 1990 through 2000 – roughly calculated – more than 38,000 Doctorates were awarded in the Region.

In Sweden and Finland, in addition to the Doctoral degree, there is a *Licenciate* degree. Close to 1,800 persons were awarded the *Licenciate* in 2000; almost 1,000, in 1990.

Of the total numbers of Doctorates awarded in the Region in 2000, 43 percent were granted in Sweden, 23 percent in Finland, and 20 percent in Denmark, while the proportion awarded in Norway represents 13 percent.

Table 7. Doctoral degrees awarded in the Nordic countries (in numbers)

Countries	1990	1995	2000
Denmark	410	796	1,000
Finland	490	758	1,156
Iceland	1	3	5
Norway	393	602	646
Sweden	1,095	1,520	2,176
Total	2,389	3,679	4,983

Source: NIFU (2002).

The preparation of women among the Doctoral candidates in 2000 was just below 40 percent. This figure represents a significant increase since 1990, when the proportion of women was 28 percent. The increase is mostly a spin-off of the general development of the position of women in the Nordic countries. Between 35 and 40 percent of the Doctorates were awarded to women in 2001, the exception being Finland with a somewhat higher numbers of women (45 percent).

Table 8. Doctoral degrees awarded to women in the Nordic countries (in percentages)

Countries	1990	1995	2000
Denmark	21.9	29.7	36.5
Finland	31.8	36.9	45.2
Iceland	..	..	60.0
Norway	16.5	31.2	35.0
Sweden	27.2	32.3	38.8
Total	25.7	31.3	39.4

Note: In Denmark, numbers, by sex, for the traditional Doctoral degree are available only as of 1998. These numbers are included in the calculations for 1990-1997. As for Iceland, the total numbers are low.

Source: NIFU (2002).

The mean age at the defense of a dissertation is relatively high and relatively stable in all the Nordic countries, all of which have data for the post-1990 period. The highest age at defense is found in Finland, Norway, and Sweden. The mean age in these countries is 37 to 38 years. The age at the defense of the dissertation is lower in Denmark (when the traditional degrees are not counted). Over the last years, the mean age in Denmark has been 34 to 35 years. The mean age, however, is related to the subject field. In the Humanities and the Social Sciences, the age at defense is often higher than in Technology and the Natural Sciences. But there are variations among the countries.

Table 9. Mean age at the defense of the Doctoral dissertation in the Nordic countries

Countries	1990	1995	2000
Denmark	33.2	34.0	34.6
Finland	37.9	37.1	37.8
Iceland	..	..	42.4
Norway	36.3	37.7	37.4
Sweden	37.9	37.9	37.7

Note: Information about age does not exist for the traditional Doctoral degrees in Denmark. Thus, the table is valid for PhD degrees. For Iceland, the calculations were made on the basis of a low number.

N.B. Figures for Denmark have not been updated. Existing numbers rely on information provided by the Danish Research Academy.

Source: NIFU (2002).

Even if the contribution of Norway to Doctoral education is relatively small, the Norwegian government has an ambitious aim to increase the numbers of awarded Norwegian Doctorates. These plans have been approved by the Parliament. Accordingly, the numbers of new Doctoral candidates will increase from 700, in 2001, to 1,100, in 2007.

4. DOCTORAL DEGREES AND QUALIFICATIONS

Admission to Doctoral Studies

To be admitted to a Doctoral degree programme, applicants must have normally earned a Master's degree/higher degree, that is, have completed five years of higher education, including a research project within the discipline for which they are seeking admission. Alternatively, they must satisfy the admission requirements through other qualifications approved by the faculty.

The faculty may require that special courses be taken or that a special test be passed for admission to the programme. An application for admission shall include an outline of the studies, including a description of the research project, a plan for the training component, a time schedule, and a plan for funding and proposed supervisor(s).

Admission is based on an overall assessment of the project description, the applicant's formal qualifications, his or her plan for the programme of study, including the time schedule, the funding plan, approved supervisor(s), and access to necessary academic and material resources at the research institution to which he or she will be affiliated.

The application for admission is addressed to the faculty, which decides upon the question of admission according to the supplementary provisions. The faculty also approves the applicant's plan for fulfilling the programme and appoints one or more supervisors. A decision to admit follows a positive recommendation of the academic community in the discipline concerned. Should the numbers of applicants exceed the capacity of admission, the faculty decides on criteria for ranking qualified applicants.

If the applicant's research project requires contact with several academic communities, statements from the relevant community/communities must be considered before the decision to grant admission is taken.

Admission to a Doctoral programme is formalized in terms of a written agreement. The contract is drawn up among the Doctoral student, the supervisor(s), and the faculty to which the student will be affiliated. It details the mutual rights and duties of the parties involved, the theme of the dissertation, the duration of the agreement, a funding plan, matters concerning supervision, place of work, and a training component. All significant changes in matters detailed in the contract must be submitted to the faculty for approval.

Organization of Doctoral Studies

The prescribed duration of study for Doctoral degrees is three years. In addition, most of the students employed by the university/college will do one year of work for the institution, preferably work relevant to the Doctoral project, thus prolonging the total length of study. The Doctoral degree programme shall be organized in such a way that the student is able to complete it within a three- or four-year period. Within this period, organized training entails a minimum of thirty study points, which correspond to one semester of study. The time interval that students have to work on their dissertations varies considerably, depending on the extent of mandatory course work and teaching duties.

For most of the types of degree, the information is for 1996-2000, because of the large numbers of *Dr. scient.* degrees not having been included in the investigation.

Persons with insufficient or incorrect data, with a time span of less than a year from intake until the handing in of the thesis, and date of intake before 1 January 1993 or unknown, have been excluded from the calculations.

Table 10. Average length of time from time of admission until defense by field of study (1996-2000)

Field of study/Type of degree	Average time (in years)		
	From time of admission to dissertation delivered	From dissertation delivered to defense	From time of admission to defense
Humanities/ <i>Dr. art.</i>	4.1	0.6	4.7
Social Sciences/ <i>Dr. polit.</i>	4.4	0.6	5.0
Economics and Business/ <i>Dr. oecon.</i>	2.7	0.3	3.0
Technology/ <i>Dr. ing.</i>	4.3	0.2	4.5
Medicine/ <i>Dr. med.</i>	3.5	0.5	4.0
Odontology/ <i>Dr. odont.</i>	4.3	0.5	4.8
All fields	4.1	0.4	4.5

Note: The material was collected through inquiries to the faculties about Doctoral candidates and to the Adjudication Committees about the quality of theses.

Source: Research Council of Norway (2002).

Table 11. Average age at time of award of Doctoral degree by field of study (1980-2002)

Field of study/Type of degree	1980	1990	1995	2000	2002
Humanities/ <i>Dr. art.</i>	40.8	42.3	44.1	43.6	42.2
Social Sciences/ <i>Dr. polit.</i>	37.2	37.9	41.6	41.8	41.2
Natural Sciences/ <i>Dr. scient.</i>	33.7	34.4	34.8	33.4	33.7
Agriculture and Veterinary Science/ <i>Dr. scient.</i>	35.8	34.6	37.4	36.4	36.7
Technology/ <i>Dr. ing.</i>	31.9	33.5	32.1	32.5	33.4
Medical Science/ <i>Dr. med.</i>	41.8	40.1	40.6	40.3	41.2
All fields	36.7	36.3	37.7	37.4	37.8

Source: NIFU (2002).

Because of the differences between prescribed time and actual time, a four-year model was discussed in relation to the evaluation of 2002. However, the Ministry of Education and Research has decided to keep the principal model of three years of Doctoral studies plus one year of work for the institution.

Requirements for the Doctoral degree include the writing of a Doctoral dissertation and a public defense after the dissertation has been approved and made publicly available. An assessment committee is appointed, having at least three members. Only one member can be from the home university. Preferably, one should be from a university outside Norway.

The training component of the Doctoral degree programme provides the academic and methodological schooling necessary with respect to work on the Doctoral dissertation and the qualifications required for professions for which in-depth scientific knowledge is required. The faculty may grant exemption from participation in parts of the training programme if corresponding requirements have been met at another institution providing recognized training.

Work on a Doctoral dissertation is carried out under the individual supervision of a member of the faculty, or, if necessary and convenient, under two or more supervisors alternatively in co-operation.

A dissertation is an independent, scientific piece of work of high academic standard with respect to the formulation of problems, the precision of concepts, its methodological, theoretical, and empirical bases, its documentation, and its form of presentation. A dissertation must contribute to the development of new knowledge and be of an academic standard appropriate for publication as a contribution to the literature in the relevant field.

Regulatory Examinations

In 2003, the Ministry of Education and Research adopted new regulations related to Doctoral students.

The Doctoral degree is awarded on the basis of the following:

- i.* a recognized scientific dissertation and a satisfactory defense thereof in a public disputation;
- ii.* the approved completion of a training programme, or any other approved academic training or qualification;
- iii.* an approved trial lecture.

To evaluate the trial lecture, the dissertation, and the dissertation defense, the Faculty appoints an expert Adjudication Committee consisting of a minimum of three members. At least one member must be from outside the evaluating institution. Provided that it is possible, the Committee should have at least one foreign member. Preferably, both sexes should be represented on the committee. All members are supposed to hold a Doctoral degree or an academic qualification equivalent to the Doctoral degree.

Within three months of the revision of the completed dissertation, the Committee is expected to submit a commented report on whether or not it is worthy of being defended for the Doctoral degree.

If the dissertation is found to be worthy of defense, the degree programme is concluded by a public trial lecture on an assigned topic determined by the Adjudication Committee, and a disputation. The Adjudication Committee evaluates the trial lecture. If the committee finds the lecture satisfactory, the Doctoral candidate will defend his or her Doctoral dissertation in a disputation open to the public.

The final approval of the candidate's work is made by the University Board on the basis of a recommendation made by the Adjudication Committee and the Faculty. (See, also, *Guidelines for the Evaluation of Candidates for Norwegian Doctoral Degrees*, 1996).

Accreditation and Quality Assurance of Doctoral Programmes

At the national level, NOKUT is responsible for the accreditation of Doctoral programmes according to the following criteria:

- a) The institution must have general regulations concerning Doctoral degrees.
- b) Doctoral degree programmes must have study programmes.
- c) The institution* must show that the area to be opened for Doctoral degree programmes has sufficient academic breadth and depth and internal academic context.
- d) The institution must have the necessary academic basis to provide research training.
- e) The academic activities of the institution must support Doctoral degree programmes. These activities must be documented.
- f) The national and international co-operation and networks of the institution relevant for Doctoral degree programmes must be documented.
- g) Doctoral degree programmes must have a satisfactory infrastructure.
- h) Routines must exist for ensuring and developing the quality of Doctoral degree programmes.

The National Standard Regulations demand a system for ensuring quality in Doctoral degree programmes. The system must include actions/initiatives to reveal lack of progress in dissertation work, failing supervision, and routines for following up lacunae and weaknesses. The system must also include routines for separate regular reporting by the student and the supervisor.

Quality assurance in the Doctoral degree programme is also formalized in terms of a written agreement, which is to be signed at admission. The contract is set up between the Doctoral student, the supervisor(s), and the faculty to which the candidate is affiliated. The document states the mutual rights and duties of the parties involved, the theme of the dissertation, the duration of the agreement, a plan for funding, matters concerning supervision, the place of work, and the training component.

Status of Doctoral Students

Most Doctoral students have the status of university or university college employees. They receive regular salaries (which ordinarily come from the university budget or from a Research Council grant). They pay income taxes, membership fees to the State Pension Fund, and social security contributions. The contracts of Doctoral students are limited to four years, including the 25 percent work obligation for the institution, or three years with no required workload other than the research training programme and the writing of the dissertation. Doctoral students have the right to paid sick leave, paid maternity leave, and usually to services provided by the local student organization or university child-care services and kindergarten for their children. At most universities, Doctoral students taking maternity leave will be granted an extra six months prolongation in

* With application to university colleges only. The universities can start new Doctoral programmes without special accreditation.

addition to the ten months that the law guarantees. The same goes for post-Doctoral students, with the exception of the provision for extra prolongation after maternity leave and a place in the university child-care services and kindergarten for the children.

Doctoral students who do not have working contracts with a degree-awarding institution will make different arrangements and will often have higher salaries than their peers working in the traditional way.

The degree-awarding institution will sign an agreement with the student's workplace to make sure that he or she will have sufficient time to devote to his or her Doctoral work. The time available, in such cases, however, may often permit part-time work for a somewhat longer period than the usual three-to-four years.

Doctoral candidates in Norway have relatively few problems in entering the labour market; however, research training has traditionally been viewed as preparation for an academic career. The objective of the new Doctoral degrees is to assure a broader social and economic relevance for research training. Research training is also expected to be relevant to areas of endeavour in society that require research and development competencies.

New Doctorate holders cannot be considered mature researchers within a modern research training system. Internationally, it has become increasingly common that a research career include a post-Doctoral contract of two to four years in duration. In order to support a successful research career, it is therefore necessary to have a well-developed post-Doctoral system. In Norway, the numbers of post-Doctoral contracts have traditionally been low. However, in recent years there has been a significant expansion in the numbers of post-Doctoral positions in just a short period, but the numbers are still low in Technology, the Social Sciences, and the Humanities.

On the assumption that the Doctorate will be undertaken at a younger age than is the case today, it is expected that the numbers of postgraduate positions will be increased in all fields in the years to come. After a successful defense of the Doctoral dissertation, the best Doctorate holders with the highest motivation should have the possibility to further develop their qualifications during a post-Doctoral period in an internationally acknowledged research community. The Evaluation Panel started a discussion on whether a post-Doctoral period should be a requirement prior to one's being appointed to a permanent position in a Norwegian university.

Recognition of Foreign and Norwegian Qualifications

As mentioned above, the Norwegian Agency for Quality Assurance in Education (NOKUT) acts as the Norwegian ENIC-NARIC Center. Recognition of studies from foreign institutions is regulated according to internationally agreed upon principles, e.g., the Lisbon Convention.

Applications for the transfer of foreign credits are evaluated individually by the higher education institution mainly in relation to the corresponding subjects in a Norwegian degree programme.

Within the framework of the Nordic Council, a special agreement guarantees acceptance of examinations and the possibility of transferring examinations within the Nordic countries.

Since 1993, National Standard Regulations have been in effect. In June 2003, the Norwegian Council for Higher Education recommended new regulations. Standard regulations serve as advisory models for academic institutions, which adopt their specific regulations with only small variations among them.

The University Council of Norway (currently, the Norwegian Council for Higher Education) has also recommended national guidelines regarding the evaluation of Norwegian Doctoral degrees (1996), standard regulations for the degree of *Dr. Philos* (1996), and a standard contract among student, supervisor, and institution (Contract Concerning Admission to Organized Doctoral Degree Programmes, 2000).

For academic education in general, the application for recognition, which is decided as per Section 48 of the Act Relating to Universities and University Colleges, may either be addressed to NOKUT or to universities and university colleges. NOKUT assesses applications and makes decisions concerning general recognition, and the higher education institutions make decisions concerning specific recognition.

The assessment of Doctoral degrees and qualifications obtained abroad is made by university-level institutions. Doctoral degrees from the other Nordic countries are generally recognized as being equal to Norwegian Doctoral degrees, but Doctoral degrees from other countries are not automatically recognized and must undergo an evaluation, particularly when the holder is applying for a faculty position at a Norwegian university.

As for titles, a person with a Doctorate from another country will use the title obtained abroad. Persons with Doctoral degrees, earned abroad, who want evaluations of their Doctorates in comparison with Norwegian degrees, can apply to a university or to a specialized university for an evaluation. The institution must then appoint a committee of three members from the academic community of the discipline concerned. The committee will assess the training programme and the dissertation and recommend approval or denial. An approval will not include the right to use a Norwegian Doctoral title. Assessment of a foreign Doctoral degree will usually take place in connection with an application for a position at a Norwegian university.

The Diploma Supplement (DS) is, according to the Lisbon Convention, a joint international supplement to a diploma. It is intended to provide sufficient independent information on higher education qualifications ensuring:

- fair academic and professional recognition of the qualification across national borders (international transparency);

- post-academic mobility for students and graduates across national borders.

As of spring 2002, Norway is issuing Diploma Supplements automatically to all students upon graduation. The Diploma Supplement is already an integral part of the electronic student registration systems at Norwegian higher education institutions. The Diploma Supplement will be provided to graduates free of charge.

The Research Doctorate

An essential problem in Norwegian research training is that students overall are relatively old when they submit their dissertations. This situation applies especially to the Humanities, the Social Sciences, Medicine, and Odontology, for which the mean age is over 40 years. By contrast, in the Natural Sciences and Technology, the mean age is about 33 years.

Comparatively speaking, Norwegian training for research is less developed than in the other Nordic countries. Differences in the total numbers of Doctorates awarded increased during the 1990s. There is a need for a considerable increase in resources both for salaries and for operating expenses in order to increase the extent of research training. As mentioned above, the Norwegian Parliament has responded positively to the plan of the Government to increase the numbers of Doctoral degrees and of training positions.

When the Evaluation Panel reveals poor efficiency in research training and a high mean age, both for commencement and completion, it may be a consequence of the fact that Norwegian universities have not fully implemented the research training system that has been formally introduced. Up to now, also, the second degree preceding the Doctorate has taken a long time to earn. This situation pertains particularly to the Humanities and the Social Sciences. Would the right solution be to increase the length of the mandatory research training period to four years, or is it possible to organize the research training more efficiently?

The Evaluation Panel recommends that Doctoral Programmes be normalized to four years. Required teaching responsibilities in the current form should be abolished and replaced by a half-year training programme in teaching and dissemination of scientific results. A separate training programme in this area, in addition to the present programme in methods and theory, would represent an important extension of research training and would qualify students for a variety of functions associated with university and college positions as well as with work in other sectors.

There is frequently a considerable time-lag between the completion of a first degree course and commencement of a Doctoral programme. The admission process is often demanding. A flexible and direct transition from a Master's degree to a Doctoral Programme might result in a more flexible and effective admission procedure and a significant reduction in the total amount of time leading to the dissertation defense. A suggestion has also

been made that the requirement that a student present a research proposal prior to admission be eliminated.

Satisfactory and regular supervision is of vital importance for the quality of the total research output. However, the Evaluation Panel revealed that the proportion of students who were dissatisfied with their supervisors exceeds an acceptable limit. Institutions are now expected to make an effort to improve supervision by preparing plans for the formation of supervisors, drafting national handbooks for supervisors and designing routines for the provision of information and guidance for new supervisors.

It is an objective of Norwegian research training that the majority of Doctoral students enjoy a relatively long stay abroad during their training programmes. In fact, only a relatively small proportion do so. Among other causes, this situation may arise from the fact that a foreign sojourn conflicts with the requirements for efficiency during one's period of study. Participation in summer schools or research programmes and regular attendance at international conferences and seminars are good alternatives.

Nevertheless, the most important way to increase the internationalization of Norwegian research training is to better exploit the ongoing extensive international research co-operation of the Norwegian research communities and their regular participation in various international arrangements. In order to facilitate the exchange of research students, efforts will be made to attract larger numbers of researchers from abroad, both professors, post-Doctoral fellows, and Doctoral students.

The Future of Doctoral Studies

Attention to questions concerning academic promotion and entitlement to future employment in academic institutions and industry have, until now, been relatively limited in discussions concerning Doctoral studies. However, the Evaluation Panel focused on the post-Doctoral period as the support to a successful academic career. Internationally, it has become increasingly common that a research career include a post-Doctoral contract of two to four years in duration. In Norway, the post-Doctoral system is yet poorly developed, but there has been a significant expansion in the numbers of post-Doctoral positions in the Natural Sciences and Medicine in recent years. The numbers of such positions in Technology, the Social Sciences, and the Humanities is relatively low. In order to support a successful research career, efforts will be made to establish a post-Doctoral system in all fields. These are the words of university spokespersons, and the Research Council of Norway is striving to increase the numbers of post-Doctoral research possibilities funded by the Council. Up until now, most post-Doctoral positions have been funded by the Research Council. The universities were granted permission to fund post-Doctoral positions from the state budget some five years ago.

There is also an ambition that Doctoral studies be relevant to industrial needs, but, so far, only issues concerning academic quality and efficiency have been the objects of focus.

Norway has just created its first centers of excellence. Doctoral training is included as part of the work of these centers. Hopefully, the centers will set a standard that others can follow. The first Nordic centers of excellence have also just been set up in the Natural Sciences. These are centers located in one place, while applications for Nordic Network Centers in the Humanities and the Social Sciences are being evaluated. European Union programmes, such as the Marie Curie Programme, also contribute to improving Doctoral training.

The Norwegian universities are working to follow up the recommendations of the Evaluation of Norwegian Doctoral Training. The Ministry of Education and Research has committed itself to funding additional Doctoral students, but has also stated that institutions that do not succeed in improving the output of their Doctoral Programmes, will have their budgets reduced.

Following the introduction of PhD programmes, attention to the quality of Doctoral studies has been increasing.

BIBLIOGRAPHICAL REFERENCES

- An Evaluation of Norwegian Training of Researchers*. Oslo: Research Council of Norway, 2002.
- Contract Concerning Admission to Organized Doctoral Degree Programmes (20 June 2000)* <<http://www.uhr.no/sentraledokument/forskrifter/index.htm>>.
- Forskingskoler i Norge? Om mål og organisering av forskerskoler i norsk forskerutdanning*. Oslo: Norwegian Council for Higher Education, 2003.
- Guidelines for the Evaluation of Candidates for Norwegian Doctoral Degrees (1996)* <<http://www.uhr.no/sentraledokument/forskrifter/index.htm>> (Will appear in English).
- Guidelines for the Evaluation of Candidates for Norwegian Doctoral Degree*. Oslo: The Norwegian Council of Universities, 1996.
- Guide to Higher Education in Norway*. Oslo: NOKUT, 2003.
- KYVIK, S., and TVEDE, O. "The Doctorate in the Nordic Countries", *Comparative Education* 34 1 (1998).
- Retningslinjer for tilsetting i utdanningsstillinger fastsatt av Utdannings- og forskningsdepartementet (10 June 2003)*.
- Statistics on Awarded Doctoral Degrees and Doctoral Students in the Nordic and Baltic Countries: Norbal Statistics on Awarded Doctoral Degrees and Doctoral Students in Norway*. Oslo: Norwegian Institute for Studies in Research and Higher Education (NIFU), 2002.
- The Quality Reform - A Reform in Norwegian Higher Education*. Oslo: The Ministry of Education and Research, 2003.
- Veiledende forskrift for graden Philosophiae doctor (PhD)* Approved by the Norwegian Council for Higher Education (17 June 2003) <<http://www.uhr.no/sentraledokument/forskrifter/index.html>>.

VII. Poland

MAREK KWIEK

1. THE DOCTORATE ENVIRONMENT

It is necessary to consider the status of Doctoral students in Poland in the current legal context delineated, in general, by the 1990 *Law on Higher Education* and, in particular, by the new *Law on Scientific Degrees and Scientific Titles* of 2003. But it is also helpful to consider the most recent legal proposals (such as the new draft of the *Law on Higher Education* of May 2003), for there is a chance that these proposals will be implemented as part of a wholesale reform package. Thus, at this point, it is necessary to retain a balance between what is in force and what may be in force, possibly during 2003. For this reason, this study will need further refinement once the new draft law is either passed or rejected (the latter being the fate of the previous ten or so draft laws produced over the past twelve years).

It is useful to view Doctoral degrees in Poland in light of the new *Law on Scientific Degrees and Scientific Titles* of 2003, *i.e.*, in the context of the Law on Doctoral degrees, Habilitations, and the title of Professor. The Doctoral degree is awarded by those academic units which have the right to do so conferred on them. This right is conferred by the Central Commission for Degrees and Titles, based on the level and scope of the research activities of the given unit and the numbers of full-time employed academics holding Habilitations and having the title of Professor. The required numbers of academics is a minimum of eight, but the limitation is that they must represent a given domain of science (or the arts) in which Doctorates are awarded. (In the case of the Habilitation, the requirement is twelve academics meeting the same conditions.) Academics need to be working in principal (and not in parallel) positions in a given unit, and may be counted only once, for the above purposes.

It is important to stress that, according to the proposed new Law, there are two kinds of higher education institutions in Poland: academic and non-academic institutions. The difference is that, within the former type of institution, at least one unit will have the right to confer Doctoral degrees. The distinction between non-academic and academic institutions has far-reaching consequences, especially for the booming private sector (for policies for the private sector in Poland, see Kwiek 2003c). In light of the above, private academic institutions are very few (two out of almost 300 in 2003) in numbers. Only academic institutions may be represented in KRASP, the Rectors' Conference of Polish Academic Institutions. Also, based on the proposed new Law, postgraduate courses would be run only by academic institutions, *i.e.*, by those that have the right to confer Doctoral degrees.

The Doctoral degree can be awarded to a person holding an MA, an MSc, or an MD degree, or an equivalent degree, who has passed the Doctoral examinations, and has presented and defended a Doctoral thesis. Doctoral examinations are organized in the fields of main disciplines in which Doctoral theses are written, in additional disciplines, and in foreign languages. A Doctoral thesis may also be a project, a construction, or a technological work, if it meets a more general requirement, that of being an original solution to a scientific problem, and if it demonstrates theoretical knowledge of a given discipline in science (or the arts).

The Doctoral defense is conducted and the degree is awarded by the Scientific Council of a faculty or of another type of academic organizational unit (in the case of higher education institutions) or by a Scientific Council (in the case of a research institute – e.g., units of the Polish Academy of Sciences). In both cases, the given unit votes on the following: to start a Doctoral defense procedure and to select a supervisor, to select at least two reviewers of the thesis (traditionally, one from the unit and one from the outside), to accept the thesis and to allow it to be defended in public, to accept the public defense, and finally, to confer the Doctoral degree. A thesis not accepted in one unit may not be defended in another unit. If the Doctoral examinations have not been passed, or the thesis has not been presented in the given time period, the Council may vote to close the Doctoral defense procedure.

The conferring of a Doctoral degree takes place the moment it is the object of a favourable vote by the Scientific Council of the respective higher education institution.

In the case of the Habilitation, the person defending a Habilitation thesis must hold a Doctoral degree and demonstrate considerable scientific output, in addition to the presentation of a Habilitation thesis. The Habilitation thesis may be either a published volume or, much less frequently, an original project, a construction, or a technological or an artistic achievement. There are three reviewers, one traditionally from the unit in which the Habilitation is defended and two from the outside. The conferring of a Habilitation needs to be confirmed by the Central Commission within six months of the Habilitation thesis defense.

The supervisor of a PhD thesis and the reviewers of both PhD and Habilitation theses may be habilitated academics or holders of the scientific title of professor. If accepted by the Scientific Council of a unit in which Doctoral or Habilitation theses are defended, the above functions may be performed by foreign academics who do not hold the above degree or title but are renowned specialists in the given field.

In Poland, Doctoral degrees are primarily awarded in the best public academic institutions – with universities in the lead – followed by technical universities and academies of medicine. The quantitative trend is that of a large increase in both the numbers of Doctoral students and of degrees awarded. The numbers of Doctoral students increased ten times between 1990 and 2001: from 2,700 in 1990, to 10,500 in 1995, and to 28,000 in 2001. Also, the numbers of Doctorates awarded increased three times in

the same period: from 1,500, in 1991, to 2,300, in 1995, and to 4,400, in both 2000 and 2001. At the same time, the numbers of students in both the public and the private sectors of higher education increased more than four times. The numbers of Doctoral students at the Polish Academy of Sciences are relatively small as compared to the numbers in higher education institutions – 2.6 percent; and so are the numbers of Doctoral students in research institutes – 1 percent.

Doctoral studies generally last four years and often one more year is added, if necessary, but rarely with stipends. The data about dropout rates are not available, but they do not seem to be high. Admission standards vary from institution to institution, and there is also a difference in admission standards for regular and for extramural students. Extramural students (24 percent) are usually fee-paying. In some disciplines, these students must pass entrance examinations. In other institutions, the first come, first served principle is observed. The use of credit transfer systems is rare if not non-existent, mainly owing to the fact that, so far, Doctoral students are not regarded as students but rather as a group of junior scholars who fall somewhere between students and junior academics employed at the given university. Both national and international mobility of Doctoral students is relatively low; however, international mobility has been increasing in recent years and is certainly prevailing over national mobility. The number of international Doctoral students is low, 2.5 percent (695 in 2001). Quality assurance mechanisms for Doctoral studies are not formalized. This fact reflects the reality by which, generally speaking, the majority of regular non-fee-paying Doctoral students do not have to do much course work during their Doctoral studies. Frequently, there are no special courses for Doctoral students. Their main attendance at universities is linked to the classes they teach rather than to any they might be taking.

Thus, the formal status of Doctoral students falls somewhere between that of students and of regular academic staff who hold no guarantee of employment after obtaining their Doctoral degrees. In the new draft *Law on Higher Education* (2003), Doctoral students are defined as students in “third level” (BA/BSc, MA/MSc, PhD) studies. Post-Doctoral employees are not recognized as such in Poland. PhD holders either obtain employment in the education sector (in a position of assistant professor – *adiunkt*) or must leave the public higher education sector, which is the probable outcome, given that the numbers of new positions in the public education sector is very limited. The recognition of foreign Doctorates is undertaken either through international, bilateral, and multilateral agreements, or by *Nostrifikation* procedures.

Doctoral students in Poland face several kinds of difficulties and challenges. Fewer than 50 percent of them receive stipends (2001), and the trend is towards fewer stipendiaries and more fee-paying Doctoral students. The chances that the holder of a newly awarded Doctorate will obtain employment in a higher education institution are very poor. Thus, four years of their study periods are “lost” in terms of the contributions

their “employers” would make to their pension schemes. Indeed, they are not actually employed – with all the consequences of unemployment for pension benefits.

An academic career today does not offer exciting job prospects in terms of remuneration and available research funding (Altbach, 2000, 2002; Enders, 2000; Huisman *et al.*, 2002). The labour market for new PhDs in some disciplines is much larger abroad (especially in the United States) than in Poland – a situation that may lead to brain drain. Even though the number of Doctoral students increased tenfold between 1990 and 2001, the number of academic staff members over that period remained relatively stable (between 70,000 and 80,000 academics in both the private and the public sectors). As a result, the chances that new Doctorate holders might have obtained employment in higher education institutions or academies of sciences were reduced considerably. While a decade ago, PhDs were produced mainly for academe, their holders now, in most cases, must seek employment outside the academic market. A vital change in recent years was the introduction, on a wider scale (25 percent today), of fee-paying extramural Doctoral students. Another dimension of change was the much wider participation of Doctoral students in international mobility schemes, especially within such European Union programmes as the Marie Curie Fellowships.

The law guarantees to those who are not academics, but are engaged in Doctoral studies, a period of paid leave of twenty-eight days for the preparation of a PhD or a Habilitation thesis.

Degrees obtained abroad are equivalent to those obtained in Poland, in the case of countries with which Poland has international agreements. In the cases of countries with which Poland does not have agreements, degrees may be recognized through the procedure known as *Nostrifikation*.

Foreign scientific degrees are recognized in Poland on the basis of the “Regulation of the Chairman of the Council of Ministers on the Rules and Procedures for *Nostrifikation* of Academic Degrees Obtained Abroad” of July 1991. The procedure for the recognition of Doctoral degrees is similar to the procedure for the recognition of higher education diplomas. The bodies that can nostrify scientific degrees are the councils of faculties that are entitled to award only the “Habilitation”.

Similarly, academic degrees, obtained in those countries with which Poland has signed an agreement on the recognition of diplomas and scientific degrees, are recognized automatically. However, some of these agreements (with Syria, Libya, former Yugoslavia, Croatia, Slovenia, Germany, and Austria) only concern the Doctoral degree (the Habilitation and the title of Professor are excluded). In addition, the agreements with Germany and Austria provide for the recognition of the Doctoral degree only for academic purposes, (*i.e.*, when the person wants to earn a higher academic degree in Poland).

There are two ways by which foreign education and foreign degrees are recognized in Poland: through bilateral and multilateral agreements and through *Nostrifikation* procedures. In the majority of cases in regard to

bilateral agreements, the mutual acknowledgements of education and qualifications pertain to both academic and professional purposes. Agreements regarding the mutual recognition of diplomas exist between Poland and the following countries: Armenia, Belarus, Bulgaria, Croatia, Czechoslovakia, the Czech Republic, Estonia, the Russian Federation, Yugoslavia, Kazakhstan, Kyrgistan, North Korea, Cuba, Libya, Moldova, Mongolia, Romania, Slovakia, Syria, Tadjikistan, Ukraine, Uzbekistan, Hungary, Vietnam, and the Soviet Union. Some of these agreements pertain to countries that no longer exist and therefore have legal force only in regard to documents awarded prior to their disintegration (e.g., the Soviet Union – prior to December 1991).

The following multilateral agreements provide the legal grounds for the recognition of scientific degrees (as well as of secondary school certificates and of the degrees granted by higher education institutions): (i) the 1975 Convention on the Mutual Recognition of Secondary and Specialized Secondary School-Leaving Certificates, of Higher Education Diplomas, as well as of Diplomas Granted for Academic Degrees and Titles – the so-called Prague Convention; (ii) the 1979 UNESCO Convention on the Recognition of Studies, Diplomas, and Degrees Concerning Higher Education in the States belonging to the European Region; (iii) the series of Council of Europe Conventions (to which Poland was admitted in 1994).

Among the conventions mentioned above, only the Prague Convention determines an unconditional equivalence of specific types of certificates and degrees issued in the former Soviet bloc countries. (Secondary school certificates, degrees certifying completion of higher education, and scientific degrees and titles are recognized equally.) Other conventions constitute general legal frameworks and encouragement of reciprocal accreditation of educational documents.

The Prague Convention (1975) is one of the legal acts governing the recognition of educational credentials obtained abroad by Poles. The signatories of the Convention are Bulgaria, Hungary, the Democratic Republic of Vietnam, North Korea, the German Democratic Republic, Cuba, Mongolia, Poland, Romania, the Soviet Union, and Czechoslovakia. These countries agreed to mutually recognize the credentials of general secondary education, vocational secondary education, higher education, and academic degrees and titles. In April 2000, the Czech Republic seceded from the convention.

2. EMPLOYMENT OF DOCTORATE HOLDERS

The situation of PhD students needs to be viewed in the general perspective of the academic profession in Poland, particularly in terms of the numbers of academic staff members and of the structure of employment (for a wider picture, see Kwiek 2003a, 2003b). The numbers of full-time faculty members in Polish public higher education institutions, during the 2001-2002 academic year, amounted to 70,000, and the numbers of non-academic staff, to 63,000. In private institutions, there

were 9,000 academic staff members and 7,000 non-academic staff members, yielding a general proportion between the public and the private sector of 8 to 1 (all numbers given here and below are rounded to the nearest thousand). Out of 70,000 faculty members in the public sector, 13,000 (19 percent) are full professors and independent academics (those holding the Habilitation), 43,000 (61 percent) are assistant and associate professors (those holding PhD and MA degrees), 13,000 (18 percent) are senior lecturers and lecturers (some of them holding Doctoral degrees), and 1,000 are foreign language instructors. These figures do not include part-time faculty and staff.

Table 1. Full-time academic faculty and staff in Poland between 1997-2001 (in numbers)

Year	Total faculty	Professors	Associate Professors	Assistant Professors	Lecturers and Instructors	Non-academic staff
2001	79,080	16,734	30,545	16,791	15,020	69,395
2000	80,208	16,400	29,654	17,844	16,312	68,056
1999	78,091	15,562	28,371	18,258	15,900	67,972
1998	74,379	14,264	26,663	18,263	15,189	64,548
1997	73,328	13,659	25,526	18,832	15,095	64,932

Source: *Main Statistical Office* (1992-2000).

Over the past six years (1997-2002), the total numbers of academic faculty members in both the private and the public sectors remained more or less unchanged, between 70,000 and 80,000 persons. The numbers of part-time staff are marginal in both sectors (4 percent, in total, in 2001), which means that almost all academics are employed full-time.

It is also interesting to observe the structure of the Polish academic profession with reference to the type of institution. The largest numbers of academics are employed in universities (31 percent), rather than in technical universities (23 percent) or in two types of academies: of Medicine and of Economics (11 percent each).

If one observes the private sector, it is interesting to note that the only type of institution in which the numbers of academics are larger in the private sector than in the public sector is that of the Academies of Economics. These institutions employ 65 percent of the academics working in the private sector. At the same time, almost 60 percent of all academics employed in the private sector work in Academies of Economics.

This particular detail, however, needs to be viewed in perspective. It is generally very easy (and marketable) for an institution to give itself the label of Academy of Economics, especially at the undergraduate level. Therefore, the majority of private institutions use this label. At the same time, it is very difficult to state how many academics work only in the private sector. An informed guess is that the higher up the academic ladder, the fewer; so that, finally, among the private sector academics, a large number of junior staff members may be working only in this sector.

For senior academics, and especially full professors, such a situation is highly exceptional (except for *professors emeriti*).

Table 2. Academic faculty and staff in Poland, by type of institution and mode of employment (in numbers, 2001)

	Public	Private	Total (public and private)
Full-time	70,222	8,858	79,080
Part-time	2,144	1,092	3,236
Total (full-time and part-time)	72,366	9,950	

Source: Main Statistical Office (2002).

Table 3. Academic faculty and staff in Poland, by type of institution (in numbers, 2001)

Higher education institutions	Total	Public	Private
Universities	25,478	24,664	814
Polytechnics	18,046	17,777	269
Academies of agriculture	5,469	5,449	20
Academies of economics	8,756	3,102	5,654
Pedagogical academies	3,815	3,403	412
Academies of medicine	8,817	8,817	0
Marine academies	592	592	0
Academies of physical sciences	1,578	1,578	0
Academies of the arts	2,679	2,613	66
Academies of theology	684	61	623
Remaining academies	1,000	0	1,000
Military academies	1,625	1,625	0

Source: Main Statistical Office (2002).

3. THE DOCTORATE AND THE HABILITATION

Two scientific degrees can be earned in Poland: the Habilitation and the Doctorate. To put it succinctly, in the Polish structure of higher education, the Habilitation opens the way for one to move on from being a junior faculty member to becoming a senior faculty member; however, full seniority of rank is only achieved with the award of the scientific title of Professor. The Habilitation, however, opens the way for an academic to become a university professor (a university function, without a scientific title). Background information on numbers, sex, and distribution among disciplines or Doctorates is given and discussed below. In the Polish context, it may also be useful to combine these data with data concerning the Habilitation.

Over the past four years, there have been significant discussions about the future of the Habilitation in the training of faculty and in the academic career, in general. Although opinions have varied, the *status quo* with regard to the existence of the two scientific degrees has been maintained and promoted for future legislative projects. The strongest support for the abolition of the Habilitation seems to be coming from trade union circles,

and the strongest opposition, from senior faculty who fear an (apparently unavoidable) lowering of academic standards (at least for as long as the standards for Doctoral dissertations are not simultaneously raised).

The numbers of all Doctoral degrees and Habilitations awarded in Poland, in 2001, in higher education institutions, institutes of the Polish Academy of Sciences, and in research and development institutes amounted to 4,400 and 755, respectively. It should be noted that 60,000 people in Poland are claiming that they are PhD-degree holders. Of these, slightly more than 41,000 were working in public higher education institutions in 1999. Although PhD-degree holders are distributed among higher education institutions and research institutions and can be found in industry and administration, the principal places in which Doctorates are concentrated are public higher education institutions. Only two private higher education institutions currently have the right to award Doctoral degrees; however, the waiting list of institutions requesting the right to do so is long.

Table 4. Doctorates awarded in Poland (in numbers, between 1991-2001)

Academic year	Total
1991	1,500
1993	2,000
1994	2,300
1995	2,300
1996	2,400
1997	2,600
1998	3,499
1999	4,000
2000	4,400
2001	4,400

Source: Main Statistical Office (2002).

The numbers of Doctoral degrees awarded annually over the last twenty-five years varied, from almost 4,000 per year, during the second half of the 1970s, to about 3,000 during the first half of the 1980s, with another decline in the second half of the 1980s and the first half of the 1990s to an average of about 2,000 per year. Interestingly enough, by the end of the 1990s, the numbers had risen sharply, once again, to a level higher than ever before – exactly 4,000 in 1999 and then 4,400, in both 2000 and 2001 (strictly speaking, the numbers of Doctorates were the following: 1,500 in 1991; 2,000 in 1993; 2,300 in 1994; 2,300 in 1995; 2,400 in 1996; 2,600 in 1997; 3,499 in 1998; 4,000 in 1999; 4,400 in 2000; and 4,400 in 2001. The “safe” annual rate of “production” of Doctorates per year, needed merely to continue the biological regeneration of this category of potential academic faculty, was set in government and independent policy reports at 3,000, taking into account the relatively high numbers of Polish Doctorate holders wishing to leave the country. Obviously, the total numbers of Doctorates awarded in 2001 indicate a trend of earning advanced credentials, but they do not reveal a general inflow of new Doctorate holders into the higher education system.

To put the matter in a nutshell, the numbers of Doctorate holders are increasing, but the numbers of those wishing and being able to begin academic careers are decreasing. In 2001, the largest proportion of the recipients of Doctorates consisted of persons between 31 and 35 years old (37 percent), between 27 and 30 (28 percent), and between 36 and 40 (16 percent). The youngest recipients of Doctoral degrees, 26 years of age and less, represented 0.70 percent, and the oldest, 51 years of age, represented 5 percent.

So far as types of institutions are concerned, the largest proportion in the production of Doctoral degrees, not surprisingly, consists of universities (38 percent), followed by academies of medicine (19 percent), and technical universities (18 percent).

Table 5. Doctorates awarded in Poland, by age of recipients (in numbers, 2001)

TOTAL of which	Age						
	26 and less	27-30	31-35	36-40	41-45	46-50	51 and over
4,400	30	1,239	1,611	684	374	243	219

Source: Main Statistical Office (1992-2002).

Table 6. Doctorates awarded in Poland by type of institution (in numbers, 2001)

Type of institution	Doctorates awarded
Universities	1,650
Academies of Medicine	852
Technical universities	780
Academies of Agriculture	358
Academies of Economics	172
Military schools	136
Academies of Physical Education	70

Source: Main Statistical Office (1992-2002).

The distribution by sex of Doctorates (and Habilitations) clearly favours men, with women being awarded 41 percent of the former (out of 4,400 in 2001), but only 29 percent of the latter (out of 755 in 2001). While in the case of Doctorates, the numbers of degrees awarded in the university system more or less equal the numbers of degrees awarded in institutions controlled by other ministries. In the case of Habilitations, it is the university system that is in the lead, awarding as many as one-third of all Habilitations.

In regard to the disciplines in which the two degrees are awarded: the single most significant domain for Doctorates consists of the Medical Sciences, in which over a quarter of all Doctorates were awarded in 2001 (26 percent), followed by the Humanities (19 percent), and the Technical Sciences (19 percent). In the case of the Habilitation, which opens the way for the academic positions of university professor and full professor, the most dynamic disciplines are the Humanities (22 percent), followed by the Medical and the Technical Sciences (16 percent each).

Table 7. Doctoral students in Poland (in numbers, 1990-2001)

Year	Total	Women	Foreign nationals
2001	28,345	12,873	695
2000	25,622	11,315	710
1999	22,239	9,713	775
1998	19,735	8,280	579
1997	16,419	6,822	718
1996	13,351	5,252	806
1995	10,782	-	715
1994	7,133	-	684
1993	4,428	-	632
1990	2,695	-	482

Source: Main Statistical Office (1992-2002).

Table 8. Doctorates awarded in Poland by field of study (in numbers, 2000)

Field of study	Doctorates awarded
Chemistry	238
Economics	317
Pharmacy	50
Physics	128
Humanities	867
Forestry	30
Mathematics	78
Medicine	897
Law	99
Agriculture	350
Technical Sciences	726
Theology	141
Veterinary Sciences	32
Physical Sciences	70
Military Sciences	40
Biology	249
Geology	88
Total	4,400

Source: Main Statistical Office (1992-2002).

The Habilitation serves as a demarcation point between junior (or auxiliary) faculty and senior (or independent) faculty, no matter how long it takes for habilitated academics to become university professors. In the 1990s, several attempts were embodied in projected draft laws on higher education to abolish the Habilitation, but the attempts were very unfavourably received by the academic community, especially by senior academics. Most likely, the degree will not be abolished, if one can judge from the latest legal proposals.

Table 9. Habilitations in Poland by age of holders (in numbers, 2001)

TOTAL	Age				
	31-35	36-40	41-45	46-50	51 and over
755	23	73	180	208	271

Source: Main Statistical Office (2002).

Table 10. Habilitations in Poland in terms of time elapsed between the award of the Doctorate and the award of the Habilitation (in numbers, 2001)

Total	2 years and less	3-8 years	9 years and over
753	2	14	737

Source: Main Statistical Office (2002).

In very broad terms, and before a new *Law on Higher Education* is introduced, junior faculty members cannot have tenure, while senior faculty members are tenured. From a legal perspective, junior faculty may be removed from the public higher education system if they fail to write and defend a Habilitation dissertation within nine to twelve years after completion of a Doctoral thesis. Senior faculty members are currently guaranteed the equivalent of academic tenure.

Professors in the public sector are not state employees, as is common in Western Europe. There is no automatic progression up the ranks in public higher education. Still, the most important factor is research rather than teaching, and passage from junior to senior rank is guaranteed by the award of the Habilitation.

The Habilitation, until fairly recently, would guarantee, with the passage of time, the post of University Professor, granted initially for five years and then renewed for life. But as the numbers of Habilitations are growing, and the numbers of university professors within a given department may not, according to internal regulations accepted in the public sector, exceed the numbers of full professors by more than 20 percent, in practice, the numbers of habilitated faculty not holding positions of University Professor may certainly be growing.

4. DOCTORAL STUDENTS

In the Polish higher education system, as mentioned above, Doctoral students rank between students and junior academic faculty. They have some of the privileges of faculty members; however, their social security coverage is the same as that of undergraduate students, and they do not receive regular salaries. Like junior faculty, they can have reduced train fares pending special arrangements made by their universities. Contributions to their pension schemes are not paid. Less than half of all Doctoral students receive Doctoral stipends, on a competitive basis, but with exemption from taxation. At the same time, Doctoral students have poor chances of being employed in the public academic sector, for the numbers of positions available are very low in the vast majority of disciplines.

The system of public higher education is relatively closed for new entrants to the profession. Regular Doctoral studies have a duration of four years, with the option of an additional year. The most recent data available for Polish higher education (for 2001) indicate that the overall numbers of Doctoral students are 28,000, including 13,000 women. Over 90 percent of Doctoral students attends public institutions (26,000, with 2,200 enrolled in private sector institutions). Less than 50 percent of

Doctoral students receive Doctoral stipends (13,000), with as few as 165 stipendiaries in the private sector. Almost half of all Doctoral students is enrolled in (traditional) universities (13,000), and some 7,000 Doctoral students are enrolled in technical universities.

Table 11. Doctoral students in Poland by type of higher education institution (in numbers, 2001)

Type of higher education institution	Doctoral students
Public	26,143
Private	2,202
Total	28,345

Source: Main Statistical Office (2002).

Table 12. Doctoral students in Poland, by field of study (in numbers, 2001)

Field of study	Doctoral students
Chemistry	1,147
Economics	3,365
Pharmacy	70
Physics	975
Geography	94
Humanities	6,770
Forestry	171
Mathematics	447
Medicine	1,666
Natural Sciences	3
Law	1,605
Agriculture	2,288
Technical Sciences	6,525
Theology	1,127
Veterinary Medicine	200
Physical Sciences	222
Military Sciences	115
Biology	1,004
Geology	551
Total	28,345

Source: Main Statistical Office (2002).

Although the numbers of Polish Doctoral students have expanded steadily each year, over the last thirteen years, the numbers of foreign Doctoral students have remained more or less unchanged, varying between 500 and 800 each year, with almost 500 in 1990, 700 in 1995, and again 700 in 2001. Despite the immense expansion in the enrollments in Polish institutions, the numbers of foreigners willing to undertake Doctoral studies in Poland seem very limited today and in fact decreased from 18 percent in 1990 to 2.5 percent in 2001. There are three areas in which the numbers of Doctoral students are very large: the Humanities (24 percent), the Technical Sciences (23 percent), and Economics (12 percent).

Current research on junior faculty and Doctoral students indicates that only 20 percent of both categories is interested in pursuing academic careers. The remaining 80 percent wants to bring advanced credentials to the labour market. More often, many Doctoral students do not any have

idea as to what they want to do in professional life, hoping to have additional time in which to choose (a widespread feeling of “negative selection” exists for Doctoral studies in certain disciplines; in other, more marketable disciplines, paid Doctoral studies exist, in which the expected level of achievement of Doctoral students is very low and no exceptional abilities are required). Very few Doctoral students are interested in academic teaching.

Traditionally, Doctoral education has been oriented toward the training of professors for higher education, *i.e.*, university teaching and scientific research. As Roger Geiger stated with respect to the United States, “the PhD as it stands today represents *too much* training for many potential consumers of graduate education; yet it is *too little* training for its traditional role of preparing future faculty” (Geiger, 1997: 248). Both in the United States and in Poland, a sharp rise in the numbers of Doctoral students took place in the 1990s. But while in the United States, the balance between the supply and demand of Doctorates raised some concerns, in Poland, the question was generally neglected. If one compares the relatively closed public higher education system and the reduced opportunities opened to recent PhDs in the private higher education sector, the current numbers of Doctoral students – 28,000 – seem to be proof of overproduction, when viewed from a traditional perspective. From a changed perspective, however, universities and Doctoral students view Doctoral education as a way of increasing one’s chances of finding employment outside academe on the highly competitive Polish labour market. Four years of study represent a long period in many professions; however, it should be remembered that the vast majority of Doctoral course programmes do not require the payment of tuition fees, and 13,000 Doctoral candidates (slightly fewer than 50 percent) receive government-funded Doctoral stipends. In the long run, the present situation is bound to change, probably with the lowering of the status of Doctoral candidates to that of simple students (as a result of the Bologna Process) and the introduction of tuition fees. The current system leaves the burden of Doctoral education with the universities, as no special funding is made available to them. PhD candidates are treated as students and are funded accordingly.

There are currently two ways to earn a Doctoral degree in Poland: enrolling in Doctoral studies or writing a dissertation independently and defending it at some university or research institute. The latter option is extremely rare but legally possible. Also, in certain higher education institutions, there are still assistants (employed by the institution) who are working on their dissertations. At the best universities, however, it is not possible to be employed prior to having completed a Doctoral degree. The cost of the defense procedure and two reviews is currently estimated at around \$1,000 USD and is covered by the institution in which the Doctoral studies have been undertaken. In the case of independent Doctoral students, the cost has to be covered by the applicant.

Doctoral studies may be organized by those academic units which have the right to confer Habilitations, *i.e.*, those which have at least twelve senior

academics in a given discipline of the Science or the Arts. As has been indicated above, they are of two kinds: regular and extramural. Only regular Doctoral studies are free of charge to the student. Doctoral students enrolled in regular Doctoral studies are obliged to teach classes in their institutions if they receive stipends, but these may not represent more than 120 hours per academic year. Doctoral students are entitled to eight weeks of summer holidays, basic social security, and healthcare contributions. They are eligible to receive Doctoral stipends (which are guaranteed to be no lower than 60 percent of an assistant's salary). Doctoral students who do not receive stipends may be employed and do additional work. Those who receive stipends need permission to do additional work and may not work full-time.

5. THE FUTURE OF DOCTORAL STUDIES

Although Doctoral studies represent a significant issue in discussions about the creation of the European Higher Education Area and the European Research and Innovation Area, especially among those concerned with studies of the academic profession, the issue, as such, has not been widely discussed in Poland. Although the trends are clear (increases in numbers, a decreasing percentage of government-funded stipends, a decreasing percentage of international Doctoral students, increased opportunities for fee-paying Doctoral students, and relatively closed access to positions in higher education institutions), the future of Doctoral studies is uncertain in terms of missions, tasks, and role in the higher education sector. Also, there is no vision in Poland relative to the use of Doctoral study as an instrument for working in Poland towards the knowledge-based economy of the future Europe of Knowledge.

A short glance at two figures – the numbers of academics (80,000) and the numbers of Doctoral students (28,000) – combined with the background information that the numbers of academics have not changed substantially over the last ten years or so, leads to the conclusion that the future of Doctoral students is certainly not, at least in the coming years, going to be in academe.

The situation of young Doctorate holders is a reflection of the situation of the whole academic sector in Poland. A temporary solution for young PhDs might be the introduction of certain post-Doctoral programmes and considerably greater flexibility in employment procedures. Currently, there are few opportunities for newly awarded PhD holders to obtain temporary contracts under research grants or to become involved in post-Doctoral training or research in any other way than through full-time employment. Also, more stringent regulations concerning principal and parallel employment (about to be introduced into the new *Law on Higher Education*) may open ways to positions in the private education sector. The current situation is that of the production of Doctoral students mainly for the outside labour market – which is good but which requires different kinds of Doctoral programmes from those traditionally focused on providing new entrants to the academic profession.

BIBLIOGRAPHICAL REFERENCES

- ALTBACH, P. G., ed. *The Changing Academic Workplace: Comparative Perspectives*. Chestnut Hill: Center for International Higher Education, 2000.
- ALTBACH, P. G., ed. *The Decline of the Guru: The Academic Profession in Developing and Middle-Income Countries*. Chestnut Hill: Center for International Higher Education, 2002.
- ENDERS, J., ed. *Employment and Working Conditions of Academic Staff in Europe*. Frankfurt am Main: Gewerkschaft Erziehung und Wissenschaft (GEW), 2000.
- GAFF, J. G. "Preparing Future Faculty and Doctoral Education", *Change* (November-December 2002).
- GEIGER, R. "Doctoral Education: The Short-Term Crisis versus Long-Term Challenge", *The Review of Higher Education* 20 3 (1997): 239-251.
- Higher Education Institutions and Their Finances* [Szkoly wyzsze i ich finanse]. Warsaw: Main Statistical Office, 1992-2002.
- HUISMAN, J., DE WEERT, E., and BARTELSE, J. "Academic Careers from a European Perspective: The Declining Desirability of the Faculty Position", *The Journal of Higher Education* 73 1 (2002): 141-160.
- KWIEK, M. "Academe in Transition: Transformations in the Polish Academic Profession", *Higher Education: The International Journal of Higher Education and Educational Planning* 45 4: June (2003a): 455-476.
- KWIEK, M. "Recent Transformations and Adaptations of Polish Higher Education", *Die Hochschule* 1/03 (2003b): 187-200.
- KWIEK, M. "The Missing Link: Public Policy for the Private Sector in Central and East European Higher Education", *Society for Research into Higher Education International News* 2 (June 2003c): 6-8.
- KWIEK, M. "Reforming Polish Higher Education in the New Millenium", *International Higher Education* 26 (Winter 2002): 5-6.
- KWIEK, M., ed. *The University, Globalization, Central Europe*. Frankfurt am Main: Peter Lang, 2003.
- MARGA, A. "Reforming the Postcommunist University", *Journal of Democracy* 8 2 (1997):159-167.
- SADLAK, J. "Globalization versus the Universal Role of the University", *Higher Education in Europe* 25 2 (2001): 243-249.
- WELCH, A. "The End of Certainty? The Academic Profession and the Challenge of Change", *Comparative Education Review* (February 1998): 1-14.

VIII. Romania

CONSTANTIN BRATIANU*

1. STRUCTURE OF THE HIGHER EDUCATION SYSTEM

By law, the higher education system in Romania includes only accredited institutions. According to Romanian legislation, all accredited higher education institutions have the status of universities. There are no differences between classical universities and polytechnics or between very large and very small institutions. Thus, the higher education system is very homogeneous. At this moment, it includes seventy-four accredited universities. There are fifty-six State universities and eighteen private universities. State universities can be grouped into forty-nine civilian universities and seven military universities.

By tradition, some of the state universities are highly specialized. For instance, there are five technical universities, four agricultural universities, six medical universities, seven arts universities, and one university of economics. The other twenty-six universities cover a diversity of fields of study. The new private universities are mostly limited to the fields of economics and law. The higher education institutions have varying designations. They may be called “universities”, “academies”, “institutes”, or “national schools”, but all of them have the same legal status, that of a university.

Private universities occupy a special niche in Romanian higher education. Before 1990, there were no private higher education institutions. The first one emerged in 1990. Some of them were created as foundations, *i.e.*, nonprofit organizations. But others were created as for-profit companies, owing to expected changes in legislation and taking advantage of the fact that, at that very moment, there was no law stating what the necessary conditions were for any institution to declare itself a university. When the new *Constitution of Romania* appeared in 1991, it recognized the possibility of the creation and the functioning of private education institutions at any level. Thus, Article 32, Paragraph (5) of the Constitution reads: “Institutions of education, including... private ones, are created and... function according to the law.”

Law No. 88, on the *Accreditation of Institutions of Higher Education and on Diploma Recognition* appeared in 1993. The first two articles put order into the situation existing at that time:

- Art. 1. Higher education institutions are created by law.

* The author would like to thank Professor Ioan Ianos, General Director for Higher Education in the Ministry of Education and Research, for his assistance in accessing the data on Academic Advisors and awarded Doctorates in Romania.

- Art. 2. Higher education institutions... function on the nonprofit principle, in conformity with criteria and standards for academic evaluation and accreditation given by law.

The 1995 *Law on Education*, in its turn, underlined the basic ideas stated above. As a result of these two laws, the process for the institutional accreditation of the private universities started in 1999, and the Parliament passed the first laws on accreditation in 2002.

University Programmes

According to Romanian legislation, there are two types of university programmes:

- *Short-term programmes of university studies having a duration of three years.* They are vocationally-oriented and are offered by university colleges. However, these colleges are not independent institutions. They are integrated within larger universities. Graduates from these colleges can enter employment directly, or may continue their education by enrolling in the long-term programmes and taking specific placement examinations.
- *Long-term programmes of university studies, four to six years in duration, function of the field of studies.* For instance, course programmes in the Humanities, in Economics, and in Arts and Sports require four years of study. Engineering and Agriculture university programmes run for five years. Medicine, Veterinary Medicine, and Architecture university programmes run for six years.

All of these programmes include three categories of courses: compulsory, optional, and supplementary. Compulsory courses reflect fundamentals, and all students enrolled in a given programme of study must take them. Optional courses are intended to cover the area of specialization more thoroughly. A student must choose one such course. Supplementary courses are generally offered in new fields of study. Students may take such a course as an extra learning load or may choose not to take one at all.

The Bologna Process generated a wide-ranging and powerful debate in the Romanian higher education system regarding the structuring of the current university programmes into Bachelor's and Master's degree programmes. Although there are no real problems for the Humanities, Economics, Arts, and Sports, that offer four-year programmes, there are many problems and ongoing discussions in regard to the transformation of the five-year block Engineering programmes into four-year Bachelor's and one-and-a-half to two-year Master's degree programmes. Indeed, even the concept of a Master's degree programme was only recently introduced into the Romanian legislation (1999).

The European Credit Transfer System (ECTS)

ECTS was developed in certain Romanian universities as a result of the TEMPUS Programme. However, these developments continued to be restricted owing to the lack of a systematic approach at the level of the Ministry of Education. Also, some ECTS implementations in Romania appeared more as bureaucratic copies of the original model than as a new way of organizing the learning process. As of the 1998-1999 academic year, this credit system has been generalized in all the universities and in all forms of university programmes. It enables the use of an analytical model for measuring the necessary intellectual effort required for knowledge acquisition and processing. The minimum number of credits per university year is sixty, according to the general European norms of Diploma recognition. A student can earn more credits than the minimum requirement by registering for optional courses. Normally, each semester is awarded thirty credits, with differences between semesters amounting to five credits. Developing and implementing ECTS in Romanian universities has helped in the setting up and delivery of international programmes offering student mobility, like the SOCRATES Programmes.

Postgraduate University Programmes

According to Romanian legislation, postgraduate studies are structured as follows:

- *In-depth specialization studies*: These studies focus on the enrichment of knowledge obtained through long-term higher education. Their duration is two to three semesters. They are conceived as advanced studies dedicated to graduates from the same field of studies. These postgraduate university programmes have been developed according to French models. However, for the Romanian higher education system, which is highly specialized, they have yielded a very large number of over-specialized experts for a very small and chaotic labour market. The final result has been reduced efficiency, if not more negative results. A few young people have been able to emigrate to other countries, like the United States, Canada, or those of Western Europe, where they have been able to put their specialized skills to profit.
- *Master's degree studies*: These studies aim at developing skills in several long-term university subjects. They run for two to four semesters. They are open to graduates from different fields of study who meet the admission requirements for such studies established by each university. Students in these programmes must present a thesis and are finally awarded a Master's degree. These Master's degree programmes are based on American models and are more suitable to the Romanian labour market than the in-depth specialization study programmes. Their structure is flexible and can be adapted to specific needs. Excellent results have been obtained,

so far, in Economics, in which MBA programmes organized in cooperation with universities in the United States and Canada have proven to be highly appreciated both by students and economic organizations and companies. The only fields in which the development of Master's degree programmes requires additional study time are those in Engineering, Agriculture, and Architecture. In Medicine, postgraduate programmes have been developed in a different format, based on national and international traditions.

- *Postgraduate academic studies*: These studies are organized by postgraduate academic schools, which are administrative structures developed within large universities, as they are related to Doctoral studies. Theoretically, their mission is to offer courses at a very high level to Doctoral students, but there are relatively few examples of a good correlation of state-of-the-art research and Doctoral studies.

2. DOCTORAL STUDY PROGRAMMES

Legislation

Art. 73 of the *Law on Education* No. 84/1995, revised in 1999, summarizes the main ideas.

- (1) The Doctorate is a superior form of education and research.
- (2) Only graduates of long-term university programmes can be admitted to [Doctoral studies].
- (3) Academic advisors are [restricted to] full university professors, academicians, or senior researchers working in the Research Institutes of the Romanian Academy. The Ministry of Education and Research, based on proposal[s] made by *Consiliul National pentru Atestarea Titurilor Universitare, Diplomelor si Certificatelor* (National Council for the Attestation of University Titles, Diplomas, and Certificates), must validate each academic advisor according to a set of established performance criteria. The quality and title of academic advisor are then awarded by order of the Minister of Education.
- (4) Only accredited institutions, according to certain performance criteria, can organize Doctoral study programmes. They are proposed by the National Council for the Attestation of University Titles, Diplomas, and Certificates, and approved by the Minister of Education as IOD., i.e., *Institutie organizatoare de doctorat* [Institution Organizing Doctoral Programmes]. These programmes are organized for full-time and part-time students. The full-time Doctoral students receive scholarships from the Ministry of Education.
- (5) For graduation [from] such a Doctoral study programme, a Doctoral Dissertation must be elaborated and defended publicly. A five-member Commission, appointed by the University Senate of a higher education institution holding IOD status undertakes the scientific evaluation of the Doctoral Dissertation.

- (6) The scientific title of Doctor is awarded by the University Senate of an institution holding IOD status. However, the degree needs to be validated by the National Council for the Attestation of University Titles, Diplomas, and Certificates. Finally, the Doctoral Diploma is awarded [following] Order of the Minister of Education.

The actual organization of Doctoral studies programmes is authorized by Government Decision No. 37/1999 and is detailed in specific Orders of the Minister of Education, mainly M. E. Order No. 4890/1999 and M. E. Order No. 4939/1999.

What follows is based on these documents.

General Presentation

Doctoral study programmes are organized in those universities having important scientific capacity and significant research programmes recognized by the Ministry of Education and granted IOD accreditation. The Romanian Academy has also been granted IOD status by Government Ordinance. A university can obtain IOD status for one or several fields of studies, based on a set of criteria, the minima of which are the following:

- i.* The university is an accredited institution of higher education and has long-term university programmes in those fields of studies apt for IOD recognition.
- ii.* The university has developed important research programmes and, therefore, is well equipped for performing research activities.
- iii.* In the particular field of studies for which it claims IOD status, the university has at least three academic advisors attested by the National Council for the Attestation of University Titles, Diplomas, and Certificates (*Consiliul National de Atestare a Titlurilor, Diplomelor si Certificatelor Universitare*).

Table 1, below, lists all the Romanian universities, which, as of September 2003, have been granted IOD status in one or in several fields of study. Table 3 presents the fundamental fields of studies and the actual fields in which Doctoral programmes have been organized. Theoretically, the current legislation allows the organization of Doctoral programmes in any field of studies, if the conditions for doing so are adequate. It is important to stress this fact, because the previous Governmental Decision, No. 590/1997, did not allow for all university studies to be complemented with Doctoral studies. This situation was a direct result of the organization of Doctoral studies in very narrow, specialized, domains; however, they could not cover all the continua of the Sciences and the Arts. Thus there remained fields for which Doctoral studies could not be organized, or there were only two or three academic advisors for the whole country. This situation prevailed in the domains of the Arts and of Sports. Moreover, the *Law on Education* requires all full professors and associate professors to hold a Doctoral degree. Thus, there were real difficulties in promoting professors in the Romanian universities of Arts. Government Decision No. 37/1999 eliminated the

difficulties. There are no longer any artificial walls between different fields of study and research. Also, the interdisciplinary research programmes have become more fluid from the organizational point of view.

Table 1. Romanian institutions authorized to organize Doctoral studies and to award Doctoral degrees

1. Politehnica University of Bucharest
2. The Technical University of Civil Engineering of Bucharest
3. Ion Mincu University of Architecture and Urbanism of Bucharest
4. The University of Agricultural Sciences and Veterinary Medicine of Bucharest
5. The University of Bucharest
6. Carol Davila University of Medicine and Pharmacy of Bucharest
7. The Academy of Studies in Economics of Bucharest
8. The National University of Music of Bucharest
9. The National University of Arts of Bucharest
10. I. L. Caragiale National University of Theatre and Cinema of Bucharest
11. The National Academy of Physical Education and Sports of Bucharest
12. Transilvania University of Brasov
13. The Technical University of Cluj-Napoca
14. The University of Agricultural Sciences and Veterinary Medicine of Cluj-Napoca
15. Babes-Bolyai University of Cluj-Napoca
16. Iuliu Hatieganu University of Medicine and Pharmacy of Cluj-Napoca
17. Gheorghe Dima Academy of Music of Cluj-Napoca
18. Ovidius University of Constanta
19. The University of Craiova
20. The University of Medicine and Pharmacy of Craiova
21. The Lower Danube University of Galati
22. George Asachi Technical University of Iasi
23. Ion Ionescu de la Brad University of Agricultural Sciences and Veterinary Medicine of Iasi
24. Alexandru Ioan Cuza University of Iasi
25. Gr. T. Popa University of Medicine and Pharmacy of Iasi
26. The University of Oradea
27. The University of Petrosani
28. The Gas-Oil University of Ploiesti
29. Lucian Blaga University of Sibiu
30. Stephen the Great University of Suceava
31. The University of Medicine and Pharmacy of Targu-Mures
32. The Polytechnic University of Timisoara
33. Banat University of Agricultural Sciences and Veterinary Medicine of Timisoara
34. West University of Timisoara
35. Victor Babes University of Medicine and Pharmacy of Timisoara
36. The Romanian Academy

Source: The author.

Organization

Doctoral programmes are organized for both full- and part-time students. Full-time students receive scholarships from the Ministry of Education. In general, part-time students are employed. They do not receive any financial assistance from the Ministry of Education. Based on proposals made by each institution with IOD status, the Ministry of Education establishes the number of full-time and part-time Doctoral student places each year. The duration of a Doctoral programme for full-time students is four years. The duration of a Doctoral programme for part-time students is

established by each IOD, according to the complexity of the field of studies and to its tradition. Usually, these programmes run for six years. Of course, based on performance, any student can finish his or her Doctoral programme in a shorter period of time.

Doctoral students may undertake up to a half of the total activities of a university assistant; *i.e.*, they may teach applications or may conduct laboratory work as part of the teaching process within a university.

Generally, the language used in Doctoral studies is Romanian. But legislation allows international students to take examinations and to write progress reports and dissertations in any international language, like English, French, or German. Also, the legislation permits the joint organization of Doctoral studies programmes in co-operation with foreign universities. For such a situation to arise, there should be a common interest and research compatibility among the concerned institutions, and a written agreement should detail the rights and the responsibilities of each party. The main idea is for Doctoral students to take advantage of the research facilities available from the involved universities. Finally, the results must be evaluated and mutually recognized by both the participating universities and the Ministries of Education. This type of scientific co-operation may also be organized for interdisciplinary fields.

Admission

Any graduate of a long-term university programme can be admitted to Doctoral studies. Graduation from a Master's degree programme is recommended but is not required by the legislation. Admission is organized as a competition, since usually there are more candidates than available places. Each year, the Ministry of Education establishes, more or less arbitrarily, the numbers of available positions for full- and part-time students for each IOD. Within each one, these numbers are then distributed among the academic advisors. Previously, the legislation limited the numbers of Doctoral students per academic advisor to ten or twelve students. Current legislation leaves this decision, if it needs to be made, to the discretion of the individual IOD.

The admission examination is organized at the beginning of each academic year. Each IOD establishes regulations for its admission examination according to its traditions and specific requirements. The Ministry of Education requires that the examination have two components: one component run by the department of the specific field of studies, which is based on professional knowledge, and the other component, run by the Department of Foreign Languages. The second component is an evaluation of the speaking, reading, and writing abilities in a foreign language of significance of candidates to undertake research in the relevant scholarly literature. If the candidate has previously obtained an officially recognized certificate of linguistic competence, such as a passing TOEFL score or the Cambridge Certificate of English, then this requirement is considered to have been met.

Structure and Content

The structure of a Doctoral study programme is presented below.

- *Examinations*: At least three examinations, that cover the fundamentals and the specifics of the given field of study, are organized. If a Doctoral student has graduated from a different field of study than his or her field of Doctoral study, other examinations will be required. For instance, an engineer admitted to a Doctoral programme in Management will have to take some extra examinations in Economics. There are no formal courses for Doctoral students. Thus, these examinations measure the level of knowledge obtained, primarily, through individual work and familiarly with the scientific literature of the field. However, students are encouraged to take certain advanced courses in the Master's degree programmes offered by the given university. The academic advisor and the IOD administration may recognize their examinations as being equivalent to the required examinations of the Doctoral programme.
- *Progress Reports*: Each Doctoral student will prepare at least three progress reports and defend them before a panel of at least three professors. The evaluation system for both examinations and progress reports is based on the following grades: very good, good, satisfactory, and unsatisfactory. If the result is unsatisfactory, the examination or progress report must be taken or presented again. All the examinations and progress reports should be completed within a period of two years, for full-time students, and within a period of four years, for part-time students. Of course, in the case of intensified work, these requirements can be satisfied in a shorter time interval. At this moment, ECTS is being implemented at the level of BSc study programmes, only.
- *Doctoral Dissertation*: Each academic advisor establishes the topic of research and then the structure and the content of a Doctoral programme for each student. The resulting Doctoral programme is to be approved by the IOD administration. Once established and approved, it becomes compulsory. Minor changes can be introduced, but only with the approval of the IOD administration. The research topic may be changed only once, if the new topic is proven to be significant for the same field of study. Any change needs to be approved by the academic advisor and the IOD administration, respectively.

The Doctoral dissertation represents a synthesis of the research undertaken by the student. It must contain original contributions to knowledge in its specific field of study. It is elaborated and written according to the regulations established by each IOD, but, at the same time, as it is a piece of scientific work, it must conform to the style of presentation of scientific papers in its field. In the fields of the Arts and

Sports, a Doctoral dissertation may be adapted to some specific requirements of language or way of expression. It can be written in Romanian or in any international language. If written in an international language (*i.e.*, in English, French, or German), the Doctoral student must prepare a summary or synthesis in Romanian.

Once the academic advisor grants his or her approval, a copy of the Doctoral dissertation is put at the disposal of the department or faculty, at least two weeks before the public defense, for consultation by those who are interested in the field. The length of the consultation period is important for colleagues who might be interested in the research topic and who might, therefore, like to ask questions during the public defense of the Doctoral dissertation. Also, there is the question of transparency.

Given the reality of organizational culture in Romania, transparency is not a fully developed process. Thus, it is very important to include measures in any piece of legislation so as to create the necessary conditions for developing transparent processes and events. The academic advisor may ask the Doctoral student to make a presentation of his or her thesis within the Department for those who might be interested in it. But, such a presentation would be optional. It would be like a scientific seminar, with questions and answers, without any voting by the people having assisted in this presentation.

For a thesis defense, each IOD establishes a commission of five members. The president of this commission is usually the Dean of the Faculty. It includes the academic advisor and three members as scientific reviewers. Two of them must be professors from other universities in Romania or in other countries. If the thesis has been written as part of a co-operation programme, the Doctoral Commission must include members from the universities involved. The Doctoral Commission for and the date of the public defense are approved by the IOD and then made public. Each member of the Doctoral Commission, except its president, must analyze the dissertation and write a report, containing clear conclusions concerning its value and his or her recommendation as to the conferring or not conferring to the candidate the scientific title of "Doctor" in the respective field of study. These reports are transmitted officially to the IOD before the scheduled date of the public defense.

The defense of a Doctoral dissertation has three sequences. First, the Doctoral student presents his or her research results; second, each member of the Doctoral Commission presents his or her written evaluation; third, the president opens the floor for questions and answers. At the end of the third sequence, each member of the commission presents a written vote for the award or not of the scientific title of "Doctor" to the candidate in the specific field of study (*i.e.*, Doctor of Mathematics, Doctor of Political Science, Doctor of Mechanical Engineering, etc.). If, on solid grounds, a member of this Commission cannot be present, he or she must submit an evaluation and a vote in advance. It will be taken into consideration by the president of the commission. Only one member of a commission may be

absent. If two or more members are absent, the public defense cannot take place. The IOD must reschedule it.

Based on the voting, the IOD will confer or not confer the scientific title of "Doctor". If the decision is to confer the title, then a copy of the Doctoral dissertation and of all documents concerning the programme are transmitted officially to the Ministry of Education for validation by the National Council for the Attestation of University Titles, Diplomas, and Certificates.

Based on the decision of the Council, the Minister of Education issues an Order to the given IOD that it award the scientific title of "Doctor" and confer the Doctoral Diploma on the candidate.

If the decision of the Doctoral Commission is to refuse to confer the scientific title of "Doctor", then the candidate will have to rewrite his or her Doctoral dissertation partially or totally, in accordance with the recommendations of the Commission. The academic advisor and the IOD administration are responsible for making certain that all of these recommendations have been implemented and that the new form of the Doctoral dissertation satisfies all requirements. If everything is in order, the IOD will transmit a copy of the Doctoral dissertation and all necessary documents to the Ministry of Education. The candidate no longer needs to defend his or her dissertation in public.

Doctoral Diplomas awarded abroad can be recognized by the Ministry of Education, following the same procedure of analysis and validation by the National Council for the Attestation of University Titles, Diplomas, and Certificates.

3. QUANTITATIVE DATA

Table 2, below, lists the numbers of academic advisors and of Doctoral diplomas awarded in three significant years: 1990, 1995, and 2000, for each IOD university. The most important universities, from this point of view, are also the most prestigious higher education institutions in Romania: the University of Bucharest, Politehnica University of Bucharest, Babes-Bolyai University of Cluj-Napoca, and Alexandru Ioan Cuza University of Iasi. If, in 1990, there were only four universities having more than one hundred academic advisors, in 2000, there were nine universities with more than one hundred academic advisors. A significant increase can be observed in the numbers of Doctoral diplomas awarded in 2000 by comparison with the situation in 1990.

Also, other universities have acquired IOD status and are actively involved in Doctoral studies and scientific research. Such universities include Stephen the Great University of Suceava and Lucian Blaga University of Sibiu. However, this significant increase in the total numbers of IOD universities, of academic advisors, and of Doctoral diplomas awarded may raise questions as to the quality of the scientific research performed and of the elaboration of Doctoral dissertations, especially with reference to the smaller and newer IODs. The author's experience as a

member of the National Council for the Attestation of University Titles, Diplomas, and Certificates reveals a slight difference in standard, as well as a real need to re-evaluate all the criteria used, so far, for designating a university as an IOD. The most important criteria must be its attainments in research and the international recognition of such achievements.

Table 2. Evolution of the numbers of academic advisors and of the Doctoral diplomas awarded by universities

Universities*	1990		1995		2000	
	AA	DD	AA	DD	AA	DD
1	178	26	252	63	312	235
2	75	14	69	12	85	65
3	8	3	8	5	12	16
4	44	13	64	28	80	101
5	182	48	222	72	387	339
6	84	22	127	77	162	258
7	68	21	105	43	156	112
8	1	-	4	7	14	15
9	4	-	4	2	3	1
10	4	-	4	-	8	6
11	2	-	3	3	13	5
12	54	4	66	20	96	67
13	75	15	84	27	101	50
14	27	3	30	13	34	23
15	108	25	103	62	191	186
16	40	5	51	29	61	64
17	3	-	6	1	6	14
18	9	-	7	5	19	17
19	37	5	57	28	55	84
20	-	-	-	-	25	22
21	38	4	43	12	46	45
22	124	13	169	40	163	95
23	23	4	34	5	39	28
24	96	13	146	45	174	193
25	28	3	65	23	87	79
26	1	-	7	11	16	55
27	27	8	22	7	23	34
28	36	8	30	10	25	31
29	6	-	22	1	38	26
30	-	-	2	1	8	2
31	20	2	33	10	35	29
32	81	16	101	21	119	63
33	24	1	15	6	33	16
34	28	3	35	15	41	32
35	36	8	65	37	71	62
TOTAL	1,601	287	2,056	756	2,740	2,472

* The full names of each university corresponding to the given number can be found in Table 1, page 136.

Note: AA = Numbers of academic advisors; DD = Numbers of Doctoral diplomas awarded.

Source: The author.

Table 3, below, presents the fundamental fields of studies and their spectra, according to Government Decision No. 37/1999. It should be noted that, previously, this list included 150 very narrowly specialized domains, for which academic advisors were accredited. Each academic

advisor was almost the only advisor in his or her field of study – a situation which was clearly nonsense from a scientific point of view. Now, the fields of study are viewed as fields of continuum and no longer as different laboratories with different labels. The continuum concept introduced in 1999 is much more flexible than the rigid listing of specializations, as was previously the practice. Also, this new vision is much more favourable to interdisciplinary research and co-operation among universities in Romania as well as among Romanian universities and universities across the world.

Table 4 lists the numbers of academic advisors and of Doctoral diplomas awarded in 1990, 1995, and 2000, in each fundamental field of study.

Table 3. Broad fields for Doctoral studies as per Government Decision No. 37/1999 regarding the organization of Doctoral studies

Specific disciplines and fields
Mathematics • Physics • Chemistry • Information Sciences
Biology • Geography • Geology • Ecology
Philosophy • Philology • History
Sociology • Political Science • Administrative Sciences • Communication • Educational Sciences • Psychology
Economics • Management • Marketing • Finance • Accounting • Cybernetics and Economics Statistics • International Business and Economics
Law
Agronomy • Horticulture • Forestry • Animal Husbandry • Biotechnology
Medicine • Odontology • Pharmacy • Veterinary Medicine
Architecture • City Planning
Mechanical Engineering • Electrical Engineering • Electronics and Telecommunications • Materials Engineering and Sciences • Computer Science Automatic Control • Chemical Engineering • Power Engineering • Transport • Mines, Oil, and Gas • Civil Engineering
Theology
Visual Arts • Music • Theater • Film and Media • Choreography • Physical Education and Sports

Source: The author.

Table 4. Evolution of the numbers of academic advisors and of Doctoral diplomas awarded by Romanian universities in given fields of study

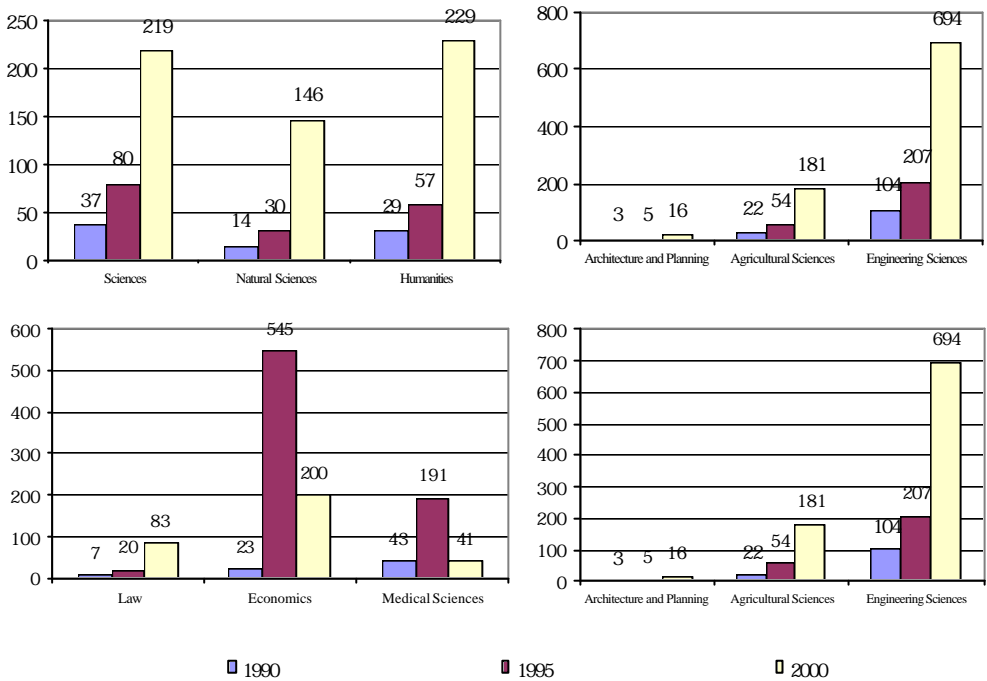
Fields of Study	1990		1995		2000	
	AA	DD	AA	DD	AA	DD
Sciences	185	37	233	80	327	219
Natural Sciences	88	14	91	30	146	146
Humanities	146	29	145	57	252	229
Political and Social Sciences	23	5	37	31	51	72
Economics	116	23	154	66	224	200
Law	27	7	27	20	48	83
Agricultural Sciences	110	22	140	54	183	181
Medical Sciences	241	43	390	191	484	545
Architecture and Planning	8	3	8	5	12	16
Engineering Sciences	643	104	790	207	936	694
Theology	-	-	20	2	33	46
Arts	14	-	21	13	44	41
TOTAL	1,601	287	2,056	756	2,740	2,472

Note: AA = Numbers of academic advisors; DD = Numbers of Doctoral diplomas awarded.

Source: The author.

Some of these data are also displayed graphically in Figure 1 below. As can be seen, the Engineering and the Medical Science fields hold dominant positions.

Figure 1. Evolution of the numbers of awarded Doctoral degrees (DD) in various subjects



Source: The author.

Table 5, below, demonstrates the relative increase in the numbers of academic advisors and awarded Doctoral diplomas for each fundamental field of study. In almost every field of study, there are relative increases of over 50 percent in the numbers of academic advisors and over 500 percent in the numbers of Doctoral diplomas awarded in 2000 as compared to the situation in 1990. The most impressive increases have taken place in Political Science: by 121.7 percent for academic advisors and 1,340 percent for Doctoral diplomas awarded; Medical Sciences by 100.8 percent for academic advisors and 1,167.4 percent for Doctoral diplomas awarded, and Economics by 93.1 percent for academic advisors and 769.5 percent for Doctoral diplomas awarded. The overall increase is of 71.1 percent for academic advisors and of 761.3 percent for Doctoral diplomas awarded.

Table 6, demonstrates the relative evolution in the numbers of academic advisors appointed and Doctoral diplomas awarded by the Romanian Academy in 1991, 1995, and 2001. Data for 1990 and 2000

were not available, owing to the discontinuities occurring in the legislation, as described above (see *Legislation*, p. 134).

Table 5. Relative increases in the numbers of academic advisors and Doctoral diplomas awarded by universities in given fields of study

Broad fields of related disciplines	Percentages	
	AA	DD
Sciences	76.7	491.9
Natural Sciences	65.9	942.8
Humanities	72.6	689.6
Political and Social Sciences	121.7	1340
Economics	93.1	769.5
Law	77.7	1085.7
Agricultural Sciences	66.3	722.7
Medical Sciences	100.8	1167.4
Architecture and Planning	0	433
Engineering Sciences	45.5	567.3
Theology	*	
Arts	*	
TOTAL	71.1	761.3

Note: AA - Numbers of academic advisors; DD - Numbers of Doctoral diplomas awarded.

* - Numbers not available as these are newly set up fields of study.

$$? (AA) = \frac{AA(2000) - AA(1990)}{AA(1990)} \times 100 ; ? (DD) = \frac{DD(2000) - DD(1990)}{DD(1990)} \times 100$$

Source: The author.

Table 6. Evolution of the numbers of Academic Advisors and of Doctoral diplomas awarded by the Romanian Academy in fields of studies

Field of studies	1991		1995		2001	
	AA	DD	AA	DD	AA	DD
Sciences	36	15	52	4	35	5
Natural Sciences	10	4	19	2	27	16
Humanities	48	5	32	5	30	5
Political and Social Sciences	1	-	1	-	-	-
Economics	20	4	21	3	18	9
Law	-	-	5	-	6	4
Agricultural Sciences*	39	7	29	14	24	30
Medical Sciences	6	-	6	2	6	1
Architecture and Planning	-	-	-	-	-	-
Engineering Sciences	5	-	3	-	9	-
Theology	-	-	-	-	-	-
Arts	-	-	-	-	-	-
TOTAL	165	35	168	30	155	70

* Degrees awarded by the Academy of Agricultural Sciences.

Note: AA - Number of Academic Advisors; DD - Numbers of Doctoral diplomas awarded.

Source: The author.

4. CONCLUSIONS

As organized and conceived by the Romanian legislation, the Doctorate is comparable and compatible with the European tradition. However, given

the importance of the Bologna Process and considering all the efforts that Romania is making in order to qualify for accession to the European Union, certain trends, challenges, and needs have to be identified in order to improve Romanian Doctoral study programmes.

Trends

As shown in Tables 2, 4, and 5 and in Figure -Set 1, there is a significant relative increase in the numbers of universities having IOD status, in the total numbers of academic advisors, and in the total numbers of Doctoral diplomas awarded. This trend will remain important in the near future because eighteen new private universities have started the process leading to the award of IOD status.

New fields of study, like the Political and Social Sciences and Economics, are developing rapidly, with astonishing rates of increase in the numbers of academic advisors and of Doctoral diplomas awarded. However, what these results really indicate is how underdeveloped at Doctoral level these fields of study were before 1990 and how great the need for their reintroduction has really been. Thus, the trend will continue, yet the dynamics will slow down.

A trend exists to open new fields of investigation and to promote more topics of an interdisciplinary and scientific nature. This trend will be developed in the future owing to existing needs and to the fact that the new legislation is flexible from this point of view.

A trend is favouring the development of international co-operation in research programmes and in associating them with joint Doctoral studies programmes. A Doctoral student can thus take advantage of study possibilities in universities in two or more countries and obtain Doctoral diplomas that are mutually recognized. This trend will continue, and it will be increasingly developed.

Challenges and Needs

The most important challenge is to increase the motivation of young people to enter Doctoral studies. This motivation has been declining for several reasons. The most important ones are the low level of interest, on the part of the Romanian labour market, for people having earned a Doctorate, the very small number of scholarships available for full-time Doctoral students, the increased possibility to earn Doctoral degrees in foreign countries having highly developed economies, the lack of advanced research facilities, and difficulties in obtaining up-to-date scientific literature. Also, many universities are not very interested in enrolling part-time Doctoral students because such students cannot undertake scientific research in their fields to the benefit of the institutions in question. To this unsatisfactory situation must be added the fact that higher education institutions, over the last years, have been severely under-funded by the Romanian Government.

Other important challenges include the increases in the numbers of full-time students with respect to the numbers of part-time students and the introduction, development, and implementation of quality assurance mechanisms. Also, when the structure of the higher education system in Romania conforms fully to the requirements of the Bologna Process, admission to a Doctoral programme will only be possible for those who have previously graduated from a Master's degree programme. Also, it is necessary to reconsider the requirements to be met by a university wishing to be awarded IOD status. There is a need to strengthen the importance of excellence in academic research fields and in the production of knowledge.

A challenge and, at the same time, an emergent need is the development of centers for the transfer of knowledge and technologies at the interface between the university and the business environment. Doing so requires the development of new capabilities for such entrepreneurial universities and obtaining the necessary rights to intellectual property. It is worth mentioning that, in the United States, the Bayh-Dole Act of 1980 (see <<http://www.cptech.org/ip/health/bd>>) has granted organizations in which research is conducted using Federal funds, particularly the universities, ownership of the results of this research, thus encouraging the application of academic research outcomes.

Finally, there is a need for a new type of university management based on strategic thinking and full financial autonomy. Science and research cannot be segmented into annual lumps with many question marks in between. Currently, the university budget is prepared and disbursed on an annual basis, and there are many difficulties in looking beyond a limited number of years. A small but important step forward has been taken through the implementation of four-year strategic management plans. Now is the time to find practical solutions for the financing of universities. The required effort calls for major changes in Romanian legislation and even greater changes in mentality. Also, it is important to develop university strategic management based on performance and not vote-seeking strategies.

The new knowledge society that is being developed needs new sources of information and eclectic data bases able to offer a better understanding of the needs and trends in academic life and in developing Doctoral studies. At this very moment, there are no such data and information bases at the level of the Ministry of Education, Research, and Youth. All the quantitative data presented in this report have been obtained by the author with the help of the Direction of Higher Education of the Ministry, by the direct questioning of all the universities having IOD status. Thus, it is necessary to develop a national data and information base on the quantitative aspects of Doctoral studies.

As underlined in the communication from the European Commission, Member States need to achieve a general consensus within the political and civil society as to the contribution which excellence in research and in universities is making, and then to enable it. Such a consensus should seek to reduce the risks associated with research, especially with

fundamental research, and with changing financial circumstances as a result of periodic political elections. Specialists consider that the period of time within which universities should be enabled to plan, to develop their own strategies, and to make full use of their autonomy could rise, when possible, to six- or even eight-year periods.

BIBLIOGRAPHICAL REFERENCES

- BRATIANU, C. "Bologna and Prague Declarations on Quality Assurance in Higher Education", in, C. RUSU, ed. *European Dimension of Quality Assurance*. Bucharest: Editura Economica, 2001, pp. 230-236.
- BRATIANU, C. *Paradigms of University Management*. Bucharest: Editura Economica, 2002.
- BRENNAN, J. *The European Dimension of Institutional Quality Management: Final Report and Recommendations*. Turin: European Training Foundation, 2000.
- COMMISSION OF THE EUROPEAN COMMUNITIES. *The Role of the Universities in the Europe of Knowledge*. Communication from the Commission of the European Communities. Brussels: COM 58 Final, 2003.
- DAMIAN, R. and IANOS, I. "Country Report on Higher Education", in, S. SEVUK, and A. KARKISHCHENKS, eds. *General Report on the Current Status of Higher Education in the Black Sea Region*. Taganrog: Black Sea Universities Network – TSURE, 2002, pp. 157-194, 2002.
- GOVERNMENT OF ROMANIA. "Law Concerning the Accreditation of the Institutions of Higher Education and Diploma Recognition No. 88/1993", *Monitorul Oficial* (1993).
- GOVERNMENT OF ROMANIA. "Law on Education No. 84/1995", *Monitorul Oficial* (1995).
- GOVERNMENT OF ROMANIA. "Government Decision No. 590/1997 Concerning the Organization of Doctoral Studies", *Monitorul Oficial* (1997).
- GOVERNMENT OF ROMANIA. "Government Decision No. 37/1999 Concerning Organization of Doctoral Studies", *Monitorul Oficial* (1999).
- GOVERNMENT OF ROMANIA. "Government Ordinance No. 59/2000 Concerning the Quality Management in Higher Education", *Monitorul Oficial* (2000).
- THE MINISTER OF EDUCATION. The Minister of Education Order No. 4890/1999 *Concerning the Fields of Doctoral Studies*. Bucharest: Ministry of Education, 1999.
- THE MINISTER OF EDUCATION. The Minister of Education Order NO. 4939/1999 *Concerning the Criteria for the Accreditation of a University as an Institution Organizing Doctoral Studies (IOD)*. Bucharest: Ministry of Education, 1999.
- Towards the European Higher Education Area*, Communiqué of the Meeting of the European Ministers in Charge of Higher Education in Prague, on May 19th 2001.

IX. The Russian Federation*

EVGENY KNYAZEV

1. INTRODUCTION

To understand Doctoral education in Russia, its tendencies, and its dynamics, it is necessary to examine the context in which it operates. The present-day system of Russian higher education has inherited the characteristic features and academic traditions of the classical continental university and of higher professional education of pre-revolutionary Russia.

The Soviet period was one of hardship, trial, and challenges. In Russia, higher education and science were vital tools in the hands of a totalitarian regime. Despite problems, Russian higher education developed and became strong over these years. At the same time, it was also burdened with the problems and inefficiencies inherited for the Soviet period. These problems can be clearly observed in the organizational culture of Russian universities resulting in changing historical traditions and the academic nature of university activities.

By the 1990s, following the disintegration of the Soviet Union, a highly centralized and integrated system of higher education had developed in Russia. The degree of centralization and integration was reflected ideologically, organizationally, and in the way higher education was funded. For this reason, the dissolution of the Soviet Union broke the ties and disrupted traditional university life, a situation that greatly affected the Doctoral programmes.

The 1990s decade was one of the most difficult periods in the history of Russian academe. Expenditure on higher education, taking inflation into account, decreased from 100 percent in 1992 to 27.9 percent in 1998. This decrease led to the suppression of fundamental research, an action that had negative impacts on research, in general, and on academic careers. Many scholars left Russia or sought economic opportunities in other fields. In addition, higher education was even more affected by the inability of the politicians and the academic community to formulate a strategy of higher education and research development during the period of decreasing academic budgets. Doctoral programmes suffered greatly.

Two observations are in order. The 1990s were a period of constant government-led reforms of education. Bureaucracies were constantly

* The author would like to express his gratitude to his colleagues, Y. Evdokimova, E. Vashurina, N. Drantusova, and P. Kuleshov, for their active and creative participation in the work of preparing this study. He is especially grateful to Professor John Ahern of DePaul University for his advice and assistance. He would also like to thank T. Bashkirova of the Tatarstan State Committee for Statistics and I. Mosicheva and T. Smirnova of the Ministry of Education for their kind assistance in the retrieval of the necessary information.

changing their titles. The State Committee for Higher Education gave way to the Ministry of Higher Education, then to the Ministry of General and Professional Education, and then to the Ministry of Education. For this reason, the use of different names for the state structures responsible for post-university professional education mentioned below should not surprise the reader. This instability also led to the reality that it was not until the late 1990s that a more or less reliable system of educational statistics started to become available. For this reason, although the statistical illustrations in this study have been collected with great effort from many sources, they do not always illustrate the process dynamics.

2. STRUCTURE

The System of Academic Degrees, Diplomas, and Academic Titles, and the Place of the Doctoral Degree

Until 1993, the system of higher education in the Russian Federation consisted of programmes of higher professional education (five years in duration and leading to the award of the Diploma of Higher Professional Education), and programmes of post-university professional education leading to the award of the degrees of Candidate and of Doctor of Science (see Figure 1).

Figure 1. System of academic degrees (before 1993)

Duration of studies (in years)	Degrees
2	Doctor of Science (<i>Doctor nauk</i>)
1	
.	↑
.	
3	Candidate of Science (<i>Kandidat nauk</i>)
2	
1	
.	↑
.	
.	
5	<i>Diploma of</i> Higher Professional Education (<i>Diplom spetsialist</i>)
4	
3	
2	
1	

Source: The author.

Figure 2. System of academic degrees (after 1993)

Duration of studies (in years)	Degrees	
2	Doctor of Science	
1		
.		
3	Candidate of Science	
2		
1		
.	<div style="display: flex; justify-content: space-between;"> ↑ ↑ </div>	
.		
6	Certified specialist	Master's degree
5		Bachelor's degree
4		
3		
2		
1		

Source: The author.

In order to develop a multi-level system of higher professional education and to integrate Russian higher education into an all-European system of higher professional education, Bachelor's and Master's degree programmes were introduced alongside the traditional five-year programmes (State Committee for Higher Education of the Russian Federation, Decision No. 42 of 10 August 1993). Figure 2 presents the current system of academic degrees in Russia.

One of the peculiarities of the Russian system of Doctoral degrees is its two-level structure. The degrees of Candidate and of Doctor of Science are awarded. Both degrees are conferred on the basis of public defense of a thesis prepared by a student. As a rule, the Candidate degree is a necessary step towards the Doctor's degree. However, not every Candidate of Science becomes a Doctor of Science. According to data compiled by the Higher Certification Commission, a newly awarded Candidate of Science will require, on average, sixteen additional years to earn the Doctor of Science degree. Specialists in Geography and Geology-Mineralogy will require the greatest amount of time: twenty to twenty-two years, and

twelve to thirteen years for psychologists, political scientists, lawyers, economists, and medical practitioners (Terekhov, 2002).

The *Candidate of Science* degree is conferred to mark the solution of a problem that has significant importance for the related area of knowledge, or for well-grounded technical, economic, and technological developments leading to the solution of crucial applied problems.

The *Doctor of Science* degree is conferred following the completion of a significant research project. This research must examine significant problems of fundamental social, cultural, economic, and political importance. It might give rise to scientifically grounded technical, economic, and technological solutions, the applications of which contribute significantly to technological progress. Comparing Figures 1 and 2, one can observe that the Candidate and the Doctor of Science degrees, as the top qualifications in the system of academic degrees in Russia, have remained unchanged.

In addition to the system of academic degrees, Russia also has a system of academic titles for professors and researchers that is linked to the standards of the State Attestation System.

According to the terms of Decree No. 74 of the Government of the Russian Federation of 30 January, 2002, "On Establishing the Unified Registry of Academic Degrees and Titles and Regulations on Conferring Academic Degrees", the titles include those of Docent (Senior Lecturer) and Professor (Full Professor).

The academic title of *Docent* is conferred on the staff of research institutions for their research activity (Docent in the area of specialization) and to academics in higher education institutions for their teaching activities (Docent in a university department).

The academic title of *Professor* is conferred on the staff of universities (Professor in a university department) and of research institutions for their research activity and for their training of postgraduate students (Professor in the area of specialization).

The academic councils of the organizations, in which candidates are employed, nominate them for the titles of Docent and Professor. The titles are conferred by the Higher Certification Commission of the Russian Ministry of Education on the basis of a recommendation from university academic councils and the results of the examination of attestation documents (the Government of the Russian Federation, Decision No. 194 of 29 March 2002). The Russian Ministry of Education also defines the order in which the attestation documents are to be prepared and determines their format.

Academic degrees and academic titles are, to some extent, linked. Normally, the title of Docent is awarded to Candidates, and the title of Professor, to Doctors of Science. All possible exceptions to this rule are covered by Government Decision No. 194 of 29 March 2002, "On the Order of Conferring Academic Titles".

Institutions Eligible to Organize Doctoral Studies and to Award Doctoral Degrees

The first Doctoral degree, the Candidate of Science, can be earned in the following ways:

- through a postgraduate programme (*aspirantura*);
- through independent postgraduate studies (*soiskatelstvo*).

Both methods require the public defense of a thesis. The same option also applies in achieving the degree of Doctor of Science:

- a Doctoral programme (*doctorantura*);
- independent Doctoral studies (*soiskatelstvo*).

These options are explained below in detail.

In 2001, 587 universities and 806 state-run research institutions of various kinds were providing opportunities for postgraduate education in Russia. Both full-time and part-time studies were offered.

The system of Russian universities is quite diverse both in terms of type of school and of branch affiliation. In addition to the Russian Ministry of Education, which was exercising its authority over 331 universities in 2001, other ministries, including those for Healthcare, Agriculture, Internal Affairs, Culture, and Transportation, as well as Federal Security have institutions of their own. The table below illustrates the branch structure and affiliation of Russian universities in 1992 and 2001.

Table 1. Branch affiliations of Russian universities

Ministries and Departments	Numbers of universities in 1992	Numbers of universities in 2001
Ministry of Education	316	331
Ministry of Agriculture	62	62
Ministry of Health	47	47
Ministry of Culture	41	58
Ministry of Transportation	10	10
State Committee for Sport	10	13
Other ministries and agencies (Foreign Ministry, Committee of Cinematography, etc.)	47	66
Total	533	587

Source: State Committee for Higher Education of the Russian Federation (1994); The author.

In spite of this diversity, all universities, regardless of their branch affiliation, are subject to licensing, attestation, and accreditation. These activities are regulated by the Russian Government and are implemented by the Russian Ministry of Education.

All the above also applies to the programmes of post-university professional education, particularly studies at postgraduate and Doctoral schools. Irrespective of the branch affiliation of a university, the general, scientific, and methodological supervision of the activities of postgraduate

and Doctoral schools as well as control over the training of academics and researchers in post-university professional education is carried out by the Russian Ministry of Education. Other ministries and agencies may establish their own regulating documents pertaining to the given areas. However, they are subject to approval by the Ministry of Education.

Universities wishing to open a postgraduate (Doctoral) school or to expand the scope of major fields for the training of postgraduate and Doctoral students must obtain state accreditation and have highly-qualified professors and researchers on their staffs. The expertise that can be mustered in support of anticipated licensing determines how well the university is prepared to offer such programmes. The expert evaluation is conducted by a committee formed by the national Ministry of Education together with local authorities (Presidency of the Russian Federation, 1992). On the basis of the conclusion of the expert committee, the Russian Ministry of Education issues an order to found a postgraduate school and issues a license for its operation.

Research organizations and institutions may also train postgraduate students and open postgraduate schools. These organizations may submit petitions to the Russian Academy of Sciences, various ministries and agencies, and state-run branches of the Academy of Sciences. A graduate school is established on the initiative of the academic council of this organization by decision of a bureau of the corresponding section of the Academy of Sciences. After completion of these formalities, all necessary documents are sent to the Ministry of Education to support the award of a license for post-university professional education.

The Dissertation Councils of the Higher Certification Commission, under the authority of the Ministry of Education, are authorized to confer the degree of Candidate of Science (Government of the Russian Federation, 11 April 2002). The Higher Certification Commission creates Dissertation Councils at well-respected universities, research centers, and research-oriented industrial organizations. The institutions in question must have the corresponding license and accreditation. Dissertation Councils are also organized in institutions of the Russian Academy of Sciences, on the order of the *Higher Certification Commission* as based on decisions of a bureau of the related branch of the Academy of Sciences.

The Ministry of Science and Technology approves the classification of research specialties (Ministry of Science and Technology, 2000). Accordingly, the fields that can be the objects of the award of academic degrees are the following:

- | | |
|--|----------------------|
| 1. Physics and Mathematics | 12. Law |
| 2. Engineering | 13. Philology |
| 3. Chemistry | 14. Pedagogy |
| 4. Biology | 15. Psychology |
| 5. Medicine | 16. Philosophy |
| 6. Veterinary Sciences | 17. Sociology |
| 7. Pharmaceutics | 18. Cultural Science |
| 8. Earth Sciences (Geography, Geology, and Mineralogy) | 19. Politics |
| 9. Economics | 20. Fine Arts |
| 10. Agriculture | 21. Architecture |
| 11. History | 22. Other |

The Dissertation Councils are specialized. Each one is authorized to consider for defense only those theses that fit a specific field and specialties within it (no more than five). For example, at Kazan State University, Dissertation Council C212.081.02. accepts theses for defense for the degree of Candidate of Science in Geography in the following three specialties: Geomorphology and Evolutional Geography; Meteorology, Climatology, and Agrometeorology and Geoecology <http://www.kcn.ru/tat_ru/universitet/nir/boardphd.ru.html>. Dissertation Council D212.081.03 accepts for defense Doctoral theses for the degree of Doctor of Science in Chemistry in the following three fields: Organic Chemistry, Physical Chemistry, and Chemistry of Elementary Organic Compounds <http://www.kcn.ru/tat_ru/universitet/nir/boarddsc.ru.html>.

According to Decision No. 74 of the Government of the Russian Federation, dated 30 January 2002, "On Establishing the Unified Registry of Academic Degrees and Titles and Regulations on Conferring Academic Degrees", only diplomas issued by the Russian Ministry of Education or other authorized state agencies are valid on the territory of Russia.

3. QUANTITATIVE DEVELOPMENTS

On 1 January 2002, 1,393 universities and research institutions in Russia were preparing specialists of the highest level of qualification. The total number of postgraduate students was 128,420. Of these, 89,828 were full-time students (see Tables 2 and 3). At the same time, there were 4,462 Doctoral students (see Table 4). In all, universities trained 110,636 postgraduate students, 77,794 of them full-time students (see Table 3), and 3,977 Doctoral students.

University postgraduate schools are the primary sources of teaching staff and researchers for colleges. Some 85 percent of all postgraduate students are studying in these schools. Over the 1992-2000 period, the numbers of postgraduate students in Russia increased by almost 2.3 times, and, at university postgraduate schools, by 2.7 times.

Table 2. Postgraduate students among higher education institutions and research organizations in Russia as per the ministry/authority of subordination (in numbers)

Organizations	Postgraduate students	Graduation		Total candidates of science
		Total	With dissertation defense	
<i>Total for 1997, of which</i>	<i>88,243</i>	<i>14,135</i>	<i>3,553</i>	<i>89,856</i>
institutions subordinated to				
–the Ministry of Education	52,312	7,917	2,253	
–other ministries	35,931	6,218	1,300	
<i>Total for 1998, of which</i>	<i>98,355</i>	<i>17,972</i>	<i>4,691</i>	<i>85,370</i>
institutions subordinated to:				
– the Ministry of Education	60,648	10,045	3,049	
– other ministries	37,707	7,927	1,642	
<i>Total for 1999, of which</i>	<i>107,031</i>	<i>21,982</i>	<i>5,953</i>	<i>84,539</i>
institutions subordinated to:				
– the Ministry of Education	67,068	12,913	3,936	
– other ministries	39,963	9,069	2,017	
<i>Total for 2000, of which</i>	<i>117,714</i>	<i>24,828</i>	<i>7,503</i>	<i>83,962</i>
institutions subordinated to:				
– the Ministry of Education	73,732	15,101	4,976	
– other ministries	43,982	9,727	2,527	
<i>Total for 2001, of which</i>	<i>128,420</i>	<i>25,696</i>	<i>6,172</i>	<i>82,152</i>
institutions subordinated to:				
–the Ministry of Education	81,069	15,659	3,517	
– other ministries	47,351	10,037	2,655	

Sources: Russian Ministry of Education (2003); State Committee for Statistics of the Russian Federation (2002).

Table 3. Postgraduate students among educational institutions and research organizations in Russia (in numbers)

Organizations	Providers of postgraduate programmes	Postgraduate students		Enrolled	Graduation	
		Total	Full-time		Total	With Dissertation defense
<i>Total for 1992, of which, in</i>	<i>1,296</i>	<i>51,915</i>	<i>29,825</i>	<i>13,865</i>	<i>14,857</i>	<i>3,135</i>
– - research institutions	853	15,168	6,212	3,232	5,325	922
– - higher education institutions	443	36,747	23,613	11,238	9,532	2,213
<i>Total for 1995, of which, in</i>	<i>1,334</i>	<i>62,317</i>	<i>40,321</i>	<i>24,025</i>	<i>11,369</i>	<i>2,609</i>
– - research institutions	828	11,488	6,221	4,024	2,814	596
– - higher education institutions	506	50,829	34,100	20,001	8,555	2,013
<i>Total for 2000, of which, in</i>	<i>1,362</i>	<i>117,714</i>	<i>83,240</i>	<i>43,100</i>	<i>24,828</i>	<i>7,503</i>
– - research institutions	797	17,502	11,937	6,075	3,813	873
– - higher education institutions	565	100,212	71,303	37,025	21,015	6,630
<i>Total for 2001, of which, in</i>	<i>1,393</i>	<i>128,420</i>	<i>89,828</i>	<i>45,241</i>	<i>25,696</i>	<i>6,172</i>
– - research institutions	806	17,784	12,034	6,092	3,859	685
– - higher education institutions	587	110,636	77,794	39,149	21,837	5,487

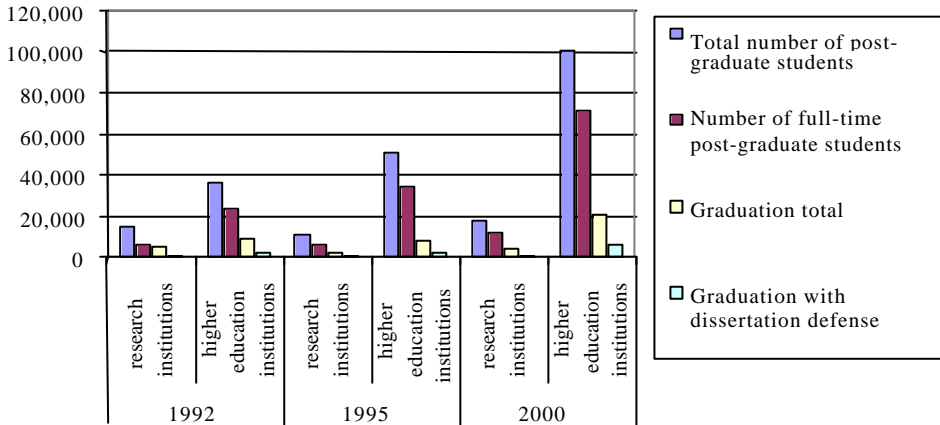
Source: State Committee for Statistics of the Russian Federation (2002).

Table 4. Doctoral students by type of institution (higher education/research): over the years 1992, 1994, 1995, 2000, and 2001 (in numbers)

Organizations	Doctoral students
<i>Total for 1992, of which</i>	1,644
– - research institutions	516
– - higher education institutions	1,128
<i>Total for 1994, of which</i>	1,724
– - research institutions	302
– - higher education institutions	1,422
<i>Total for 1995, of which</i>	2,190
– - research institutions	483
– - higher education institutions	1,707
<i>Total for 2000, of which</i>	4,213
– - research institutions	505
– - higher education institutions	3,708
<i>Total for 2001, of which</i>	4,462
– - research institutions	485
– - higher education institutions	3,977

Source: State Committee for Statistics of the Russian Federation (2002).

Figure 3. Postgraduate students in educational institutions and research organizations in Russia



Source: State Committee for Statistics of the Russian Federation (2002).

In terms of statistics, an average postgraduate school trains 188 students. However, these averages mask significant discrepancies. If some universities have no more than twenty to thirty postgraduate students, others may have several hundred. Thus, Kazan State University had 622 postgraduate students in 2001 (Ministry of Education of the Russian Federation, 2001).

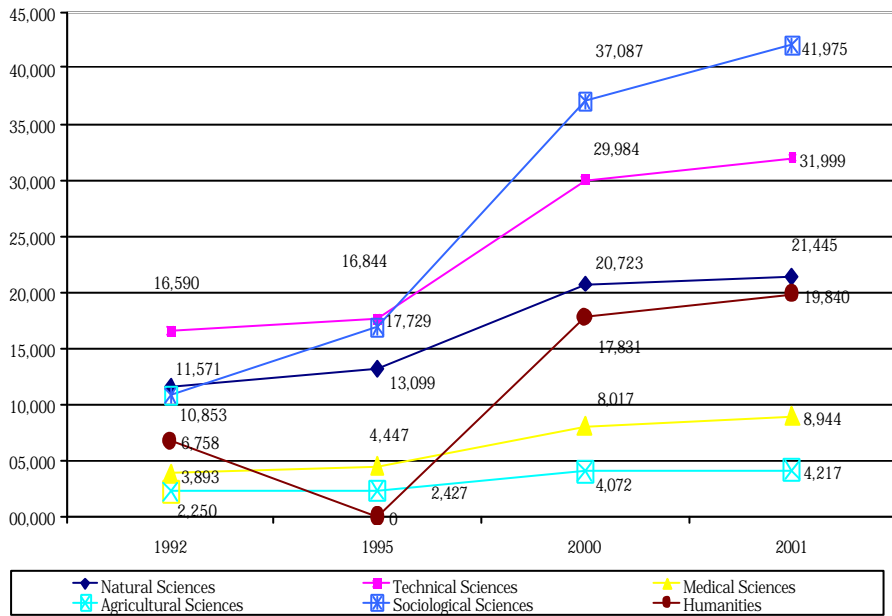
At the same time, there are postgraduate schools in 806 research institutes (most of them belonging to the Russian Academy of Sciences) training 15 percent of all postgraduate students. Each school at these

institutes has on average twenty-two students, *i.e.*, 8.5 times fewer than in the universities. One notices that, from 1992 to 1999, the numbers of students in these schools remained more or less unchanged. Only since 2000 have the figures been increasing a little, to a total of 17,784 enrollments in 2001 (Sheregi *et al.*, 2002).

The most important factor in evaluating the effectiveness of studies at a postgraduate school is the speed at which students earn their degrees. In this respect, postgraduate schools in research institutes fall considerably behind their university counterparts: with 17.8 percent *versus* 25.2 percent, respectively (Sheregi *et al.*, 2002).

There is a striking regional disproportion in postgraduate training: 45 percent of all institutions providing postgraduate studies are located in the Central Federal District with over 60 percent of them in Moscow. As a result, one-third of all postgraduate students (about 40,000) is studying in Moscow, which is leading to imbalances on the Russian market for highly qualified academic staff (Sheregi, *et al.*, 2002).

Figure 4. Postgraduate students by field of science in 1992, 1995, 2000, and 2001



Note:

- Natural Sciences: Physics, Mathematics, Chemistry, Biology, Earth Sciences
- Medical Sciences: Medicine, Pharmaceuticals
- Agricultural Sciences: Agriculture, Veterinary Sciences
- Social Sciences: Political Science, History, Economics, Philosophy, Law, Sociology
- Humanities: Philology, Pedagogy, Psychology, Fine Arts, Architecture

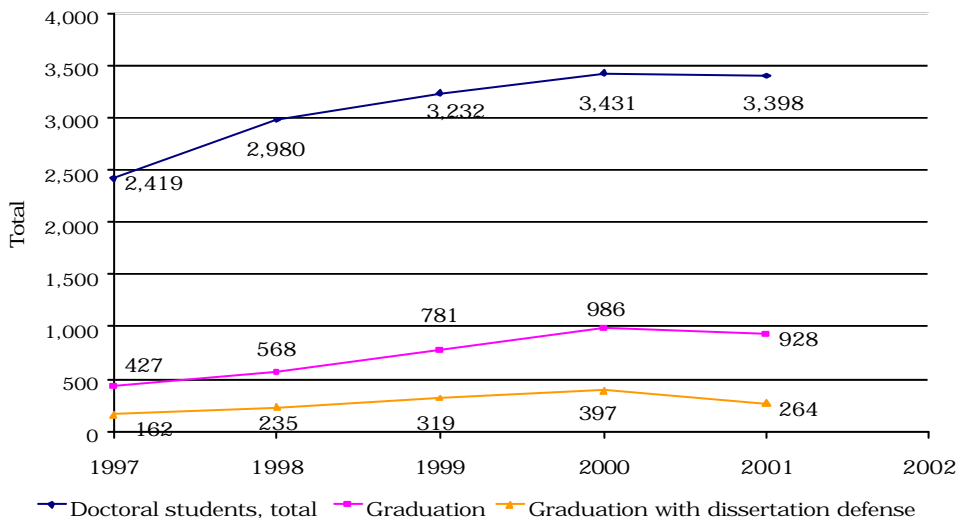
Source: State Committee for Statistics of the Russian Federation (2002).

The evolution of the numbers of postgraduate students in fields of study is also of special interest, since it reflects the social and economic transformations occurring in Russia and causes changes in the demand for professionals. Thus, in 1992, postgraduate students in Engineering and Science represented up to 56.4 percent, a figure that decreased to 40.9 percent in 2000, and has been falling ever since. The areas of Physics-Mathematics and Chemistry have been affected most drastically: from 10 percent and 3.5 percent, in 1992, to 6.4 percent and 2.5 percent, in 2000, respectively. At the same time, the proportion of postgraduate students in Economics rocketed: from 10.2 percent, in 1992, to 18.2 percent, in 2000, with the numbers of students increasing by four times. The same is true for Law students, with this segment growing from 1.9 percent to 4.9 percent or 5.6 percent, numerically. In the case of students in Political Science (respectively, 0.5 percent and 0.8 percent), numerical growth was multiplied by 4.2 times (see Figure 4).

At Doctoral level, 492 institutions in Russia train Doctoral students, a number that has increased by 25 percent since 1995 (see Table 4). The training of Doctoral students is concentrated almost entirely in the Central Federal District and, predominantly, in Moscow.

On average, 38.8 percent of students completed a Doctoral school and defended a thesis in 2000; of these, 41.7 percent in schools of research institutes and 38.4 percent in university schools (see Tables 5-7) (Russian State Committee for Statistics of the Russian Federation, 2001).

Figure 5. Doctoral students in institutions subordinated to the Russian Ministry of Education



Source: Ministry of Education of the Russian Federation (2003).

Table 5. Doctoral students in institutions subordinated to the Russian Ministry of Education (1997-2001) (in numbers)

Doctoral students	Year				
	1997	1998	1999	2000	2001
Total	2,419	2,980	3,232	3,431	3,398
Graduation	427	568	781	986	928
Graduation with dissertation defense	162	235	319	397	264

Source: Ministry of Education of the Russian Federation (2003).

Table 6. Doctoral students by field of science in institutions subordinated to the Russian Ministry of Education (2001) (in numbers)

Field of science	Doctoral students	Graduation	Graduation with Dissertation defense
Total, including	3,477	936	266
Physics and Mathematics	418	141	26
Chemistry	126	43	15
Biology	109	34	6
Technical Sciences	935	291	84
Agricultural Sciences	11	1	0
History	228	51	17
Economics	361	87	30
Philosophy	239	58	13
Philology	364	74	25
Law	33	7	2
Pedagogical Sciences	314	70	30
Medicine	13	2	0
Pharmaceutics	0	0	0
Veterinary Sciences	1	0	0
Fine Arts	1	0	0
Architecture	9	1	0
Psychology	76	14	3
Sociology	85	21	6
Political Science	18	5	2
Cultural Studies	13	1	1
Earth Sciences	116	31	5
Other	7	4	1

Source: Shlenov (2002).

Table 7. Doctoral students in institutions subordinated to the Russian Ministry of Education (2001) (by tuition, in numbers)

Category of students	Students - beginning of academic year	Enrolled	Withdrawal before end of academic year	Graduation		Students - end of academic year
				Total	With Dissertation defense	
Tuition waivers (funded from the Federal budget)	3,188	1,200	143	909	253	3,336
Contract-based (paying) Doctoral students	56	28	3	19	11	62
Total	3,244	1,228	146	928	264	3,398

Source: Strikhanov and Mosicheva (2002).

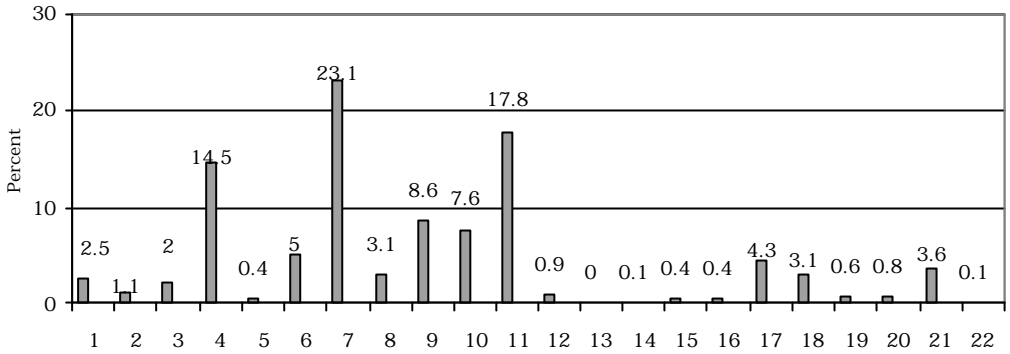
These degrees can also be earned through independent study (*soiskatelstvo*). This route is rather popular in Russia. For example, 25,955 independent students (*soiskateli*) were registered by the Russian Ministry of Education in 2001. The same statistics report that 54.5 percent of all Doctoral theses and 38.9 percent of all candidate theses were defended following this form of preparation (see Tables 2 and 5). The highest numbers of *soiskateli* can be found in the technical, economic, and pedagogical areas (see Table 8).

Table 8. Numbers of independent research trainees (*soiskateli*) in institutions subordinated to the Russian Ministry of Education, by field of science (2001)

No.	Field of science	Trainees	Graduation with defense of Dissertation for the degree of	
			Doctor of Science	Candidate of Science
	<i>Total, of which</i>	25,955	316	2,236
1.	Physics and Mathematics	642	15	69
2.	Chemistry	276	10	51
3.	Biology	524	15	76
4.	Technical Sciences	3,775	96	349
5.	Agricultural Sciences	97	2	10
6.	History	1,295	21	110
7.	Economics	6,000	54	386
8.	Philosophy	806	8	61
9.	Philology	2,231	22	163
10.	Law	1,971	9	100
11.	Pedagogical Sciences	4,616	29	550
12.	Medicine	231	3	30
13.	Pharmaceutics	6	0	0
14.	Veterinary Sciences	31	0	2
15.	Fine Arts	115	1	3
16.	Architecture	100	0	14
17.	Psychology	1,124	6	71
18.	Social Sciences	799	6	62
19.	Political Science	166	1	17
20.	Cultural Studies	202	1	17
21.	Earth Sciences	923	16	89
22.	Other	25	1	6

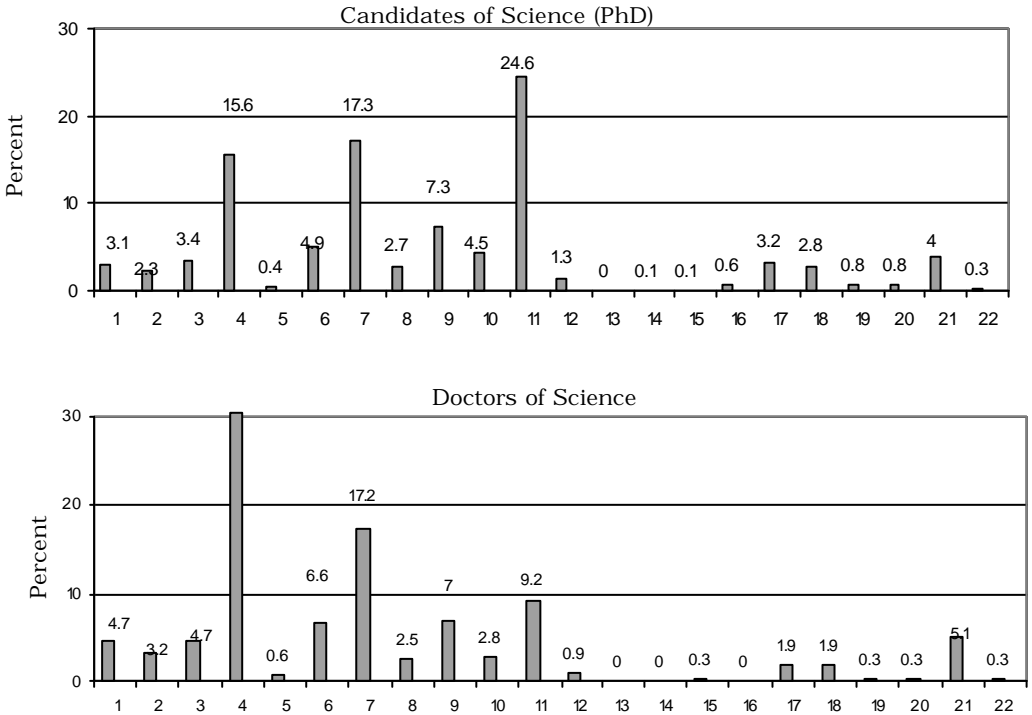
Source: Shlenov (2002).

Figure 6. Percentages of independent research trainees (*soiskatel*) in institutions subordinated to the Russian Ministry of Education, by field of science (2001)



Source: Shlenov (2002).

Figure 7. Percentages of independent research trainees (*soiskatel*), who defended their dissertations in institutions subordinated to the Russian Ministry of Education, by field of science (2001)



Source: Shlenov (2002).

4. DOCTORAL DEGREES AND QUALIFICATIONS – ORGANIZATION OF STUDIES, EXAMINATIONS, AND PROCEDURES

Legal and Academic Regulations Regarding Doctoral Studies and/or Programmes Leading to Such Qualifications

The legal regulation of studies at postgraduate and Doctoral schools is the purview of Federal laws, decrees of the Russian Government, and orders by the Ministry of Education and the Ministry of Science and Technology. In general, they define State policy in the area of post-university (graduate) education and the general academic order of postgraduate and Doctoral programmes. This order includes mastering the content and terms of programmes, selection criteria and procedures, and requirements for the attestation of *soiskateli*, etc. The immediate organization of education (enrollment, approval of individual plans and thesis titles, appointment of research supervisors, etc.) is within the remit of the institutes providing postgraduate and Doctoral studies.

Let us consider in greater detail the organization of graduate student training. The legislation defines a postgraduate school as one of the main forms of training for faculty and researchers in the system of post-university professional education. A postgraduate school provides full-time and part-time studies for a duration of three and four years, respectively. The contents and methods of teaching at a postgraduate school are defined by the Provisional Requirements for the main educational programmes of postgraduate professional education in various fields of study. These requirements were introduced by Order No. 535 of the Ministry of Education of 21 February 2002, and will be valid until the end of 2005. They assume that postgraduate students study general and specialized disciplines (a foreign language, philosophy, a discipline of specialization), have teaching experience, additionally study a special discipline for the qualification of “faculty member”, prepare and pass the Candidate examinations, and submit a Candidate thesis.

In order to study and to write a thesis, a postgraduate student must become affiliated with a department in his or her discipline. When a student enters a school, he or she is assigned to an academic supervisor who must hold a Doctorate of Science and be a Professor. Each graduate student must submit an individual plan and the title of a thesis for approval by the academic council of his or her organization. The supervisor makes certain that the student follows the approved plan. In addition, he or she is evaluated annually by the department (unit, section, laboratory) and must report on the implementation of his or her individual plan to the academic councils of other universities (faculties) and scientific councils of research institutes.

In addition to full- or part-time study at a postgraduate school, there is also the possibility for independent study (*soiskatelstvo*). *Soiskatelstvo* assumes that the given Candidate(s) (*soiskatel[i]*) will be attached to a university or a research institute for the purpose of preparing for, taking,

and passing the Candidate examinations and/or of preparing a Candidate thesis. In order to be eligible for *soiskatel* status, one must have completed a higher professional education programme, had an interview, with positive results, with a research supervisor, and received approval for enrollment from the relevant department (unit, section, or laboratory).

A person can be enrolled for *soiskatelstvo* to prepare for and to pass the candidate examination for no longer than two years, and to prepare the candidate thesis, for no longer than three years. *Soiskateli*, as well as regular postgraduate students, are assigned to scientific supervisors. Their individual plans and these subjects are similarly approved, and they are reviewed annually. The procedure for passing candidate examinations and for presenting and defending theses are the same for *soiskateli* and/or regular postgraduate students.

Admission Standards and Qualifications: Procedures for the Organization of Studies and Examinations

Persons holding higher education qualifications are admitted to postgraduate schools on a competitive basis. In most cases, postgraduate study is the continuation of professional education in the same field. Only medical and veterinary postgraduate students must have been in higher education in the respective area. If the areas studied in undergraduate higher education and the area of a prospective graduate thesis are different, an additional examination in this new field can be assigned to the applicant. The abilities of applicants to undertake research are also taken into account. This ability can be confirmed by the writing and submission of a paper on the proposed area of the thesis, a list of publications, or recommendations.

Prospective postgraduate students are interviewed by a future supervisor who informs the admissions board of the results. Based on the results of an analysis of an applicant's documents and interviews with the supervisor, the admissions board takes a decision on allowing the candidate to take the entrance examinations. The entrance examinations for postgraduate schools include tests in Philosophy, a foreign language, and a discipline of specialization. Examination syllabi reflect the State Educational Standards for higher professional education.

Based on the results of the entrance examinations, the admissions board takes a decision on each candidate so as to provide for the competitive enrollment of people best prepared for research and education.

Evaluation of Foreign Qualifications for Admission to or Continuation of Doctoral Studies and Programmes

Foreign students can study in Russian postgraduate and Doctoral schools on the basis of international and inter-governmental agreements within the framework of international projects and programmes and on the basis of contracts that they may conclude with Russian universities. Various international offices at universities in Russia are in charge of this activity. International candidates for Russian postgraduate and Doctoral schools

must meet the requirements for qualification (educational) and be fluent in Russian (proved by success on an examination similar to the TOEFL examination for English, taken at an authorized center).

The Department of Credential Evaluations, subordinated to the Ministry of Education, is authorized to evaluate international qualifications and degrees for the enrollment of foreign students in post-university programmes. The following documents provide the legal foundation for foreign students to study at this level: *The Law on Education*, *The Federal Law on Higher and Post-University Professional Education*, and the Order of the Minister of Education *On Approving the Order of Acknowledging and Establishing the Equivalence of International Educational Documents and Scientific Status*, of 9 January 1997.

The Lisbon Convention (The Convention on the Recognition of Qualifications concerning Higher Education in the European Region, of 11 April 1997) was signed and ratified by Russia and became effective on 1 July 2000. However, its provisions have not been reflected in Federal Laws and Decrees, even though the accepted interpretation of the term, acknowledgment, totally corresponds to the official definition of the Lisbon Convention.

There is a growing tendency to bypass the centralized system for the evolution of international qualifications and to pass this authority on to the host university. According to this decentralized model, the Russian Ministry of Education provides the legal and normative basis. The National Information Center for Academic Acknowledgment and Mobility, under the Russian Ministry of Education, is already operating at the Russian Peoples' Friendship University in Moscow. Other similar structures provide informational and methodological assistance and organize training sessions for university experts.

The system of credits is not widely used in the Russian system of education. However, several examples can be cited. They involve certain universities, that, in co-operation with their American or European partners on international projects, have attempted to adopt ECTS or the American system of credits in order to create their own systems for the calculation of student loads. This willingness to experiment can probably be explained by the forthcoming (and much delayed) introduction of the Russian system of higher education into the Bologna Process.

*Thesis/Dissertation and Examination Requirements/Procedures of Evaluation/
Final Defense/External Confirmation of the Degree/Title*

The preparation for and the taking of examinations for the Candidate of Science degree are integral parts of postgraduate programmes and are required of all persons seeking this degree. The following candidate examinations are always given: Philosophy, a foreign language, and the discipline of specialization. Students seeking the Candidate degree and holding a diploma of higher education in a different scientific area than the prospective dissertation must take an additional examination in a relevant

discipline (Decision No. 74 of the Government of the Russian Federation of 30 January 2002).

The structure of the candidate examinations in Philosophy and in foreign languages is approved by the Ministry of Education.

Academic programmes for the preparation of the Candidate's examination in the discipline of specialization consist of two parts. The first part is developed by the leading higher education and research institutions and is approved by the Ministry of Education. The second is developed by the department of the given school (laboratory, sector) itself (Order No. 814 of 27 March 1998 of the Ministry of Education of the Russian Federation). A four-score evaluation system with the following grades is used: "excellent", "good", "satisfactory", and "unsatisfactory".

The main purpose of Doctoral studies is to prepare the student for the defense of his or her dissertation. Requirements for the content and design of the dissertation as well as for the procedures for its submission and defense are established by the Higher Certification Commission of the Ministry of Education.

A dissertation defense has several steps: First, the dissertation is submitted for preliminary evaluation to the department at the student's university (the *preliminary defense*). Experts evaluate the quality and the relevance of the dissertation subject. They examine its scientific orientation, the degree of the author's personal participation in obtaining research results, and the degree of validity of the scientific findings, propositions, and conclusions. Additionally, they examine the scientific value of the author's research publications, the practical value of the dissertation, the possible uses of its results, and the relevance of the dissertation content to the discipline. If satisfied, the experts will recommend the dissertation for defense and submit it to the Dissertation Council for preliminary consideration and further defense.

Second, a commission composed of members of the Dissertation Council evaluates the dissertation (the *preliminary evaluation*). After consideration of the dissertation, the commission reaches a conclusion as to its quality. The members of the commission also evaluate the completeness of presentation of the dissertation materials in the author's publications. A further conclusion results in the assignment of an expert (leading) organization and two *official opponents*, and, if necessary, the enlargement of the Dissertation Council. The leading organization provides a reference. The reference must demonstrate the importance of the results obtained and provide recommendations on the application of the results and the conclusions. Official opponents are appointed by the Dissertation Council or the Higher Certification Commission from among competent professors in the discipline (Raizberg, 2002). The official opponent is an official reviewer who must write the reference on the dissertation, participate in person in the defense process, and present the reference orally (Raizberg, 2002).

Third, the defense of the dissertation is undertaken in public, in the form of a scientific debate. No fewer than half of the members of the

Dissertation Council and both official opponents must be present at the defense. Upon completion of the defense procedure, the members of the Dissertation Council vote by secret ballot on whether or not to confer the Candidate of Science degree. In the case of a positive decision, the Dissertation Council must submit the applicant's documents, within thirty days, to the Higher Certification Commission of the Ministry of Education.

Rejected dissertations may be revised and submitted to a second defense no sooner than a year following the negative decision. In this case, the official opponents and the expert organization must be different than in the case of the first defense.

The final consideration of the applicant's certification documents and the final conclusion regarding the conferring of the scientific degree are made by the Higher Certification Commission. A Higher Certification Commission Expert Council will carefully study the conclusions of the Dissertation Council. If the Expert Council decides that the decision made by the Dissertation Council has been incorrect, it may submit the dissertation and the applicant's documents to a different Dissertation Council for additional evaluation.

The degree is awarded when the presidium of the Higher Certification Commission reaches a positive decision.

Quality Assurance Mechanisms and Procedures

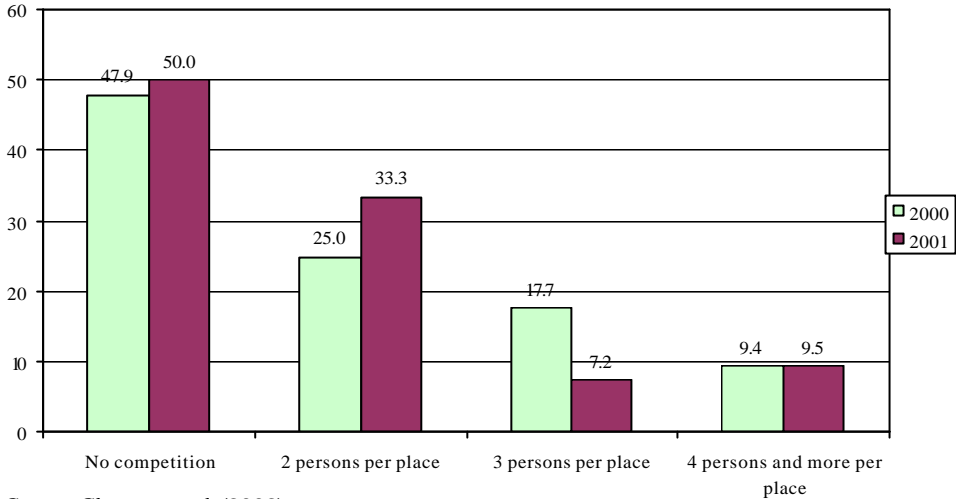
Quality assurance for postgraduate programmes is assumed by the procedures of accreditation, licensing, and certification that are regulated by the State Federal bodies and education bodies.

Only educational and scientific institutions having state accreditation and which are licensed to undertake educational activities in the field of postgraduate vocational education have the right to organize postgraduate programmes. The State Educational Standards of Postgraduate Vocational Education are also considered to be quality assurance mechanisms of postgraduate study at national level. They set requirements for the level of preparation, content, terms, and conditions of academic programmes, as well as the requirements for the knowledge and skills of graduates and for the final state certification of postgraduate students.

The procedure for admission to postgraduate programmes must provide for the enrollment of the best-prepared applicants for advanced course programmes and for research. The criteria for the selection of postgraduate courses are listed above. Entrance examinations play an important role in this process. Preparation programmes for entrance examinations are developed by educational institutions and organizations in accordance with the state academic standards for postgraduate vocational education. Approximately two-thirds of postgraduate students enter postgraduate courses immediately upon graduation. In 1995, postgraduate students under the age of 26 constituted 56.4 percent of the total, and in 2000, 70.8 percent.

In 2001, 94.8 percent of applicants were admitted on the first attempt. But this favourable outcome may be the result of the small number of applicants (Sheregi *et al.*, 2002).

Figure 8. Competition for access to postgraduate programmes in the Russian Federation (in percentages)



Source: Sheregi *et al.* (2002).

The numbers of male postgraduate students increased at the start of the 1990s owing, probably, to the military service obligations. The increase has been especially noticeable in postgraduate programmes in education institutions: from 53.6 percent in 1995 to 67.3 percent in 2000 (Russian State Committee for Statistics of the Russian Federation, 2001). After the repeal of a law exempting male graduates of higher education institutions from required military service, and especially because of the Chechen conflict, postgraduate education has been used as a legitimate way to avoid military service.

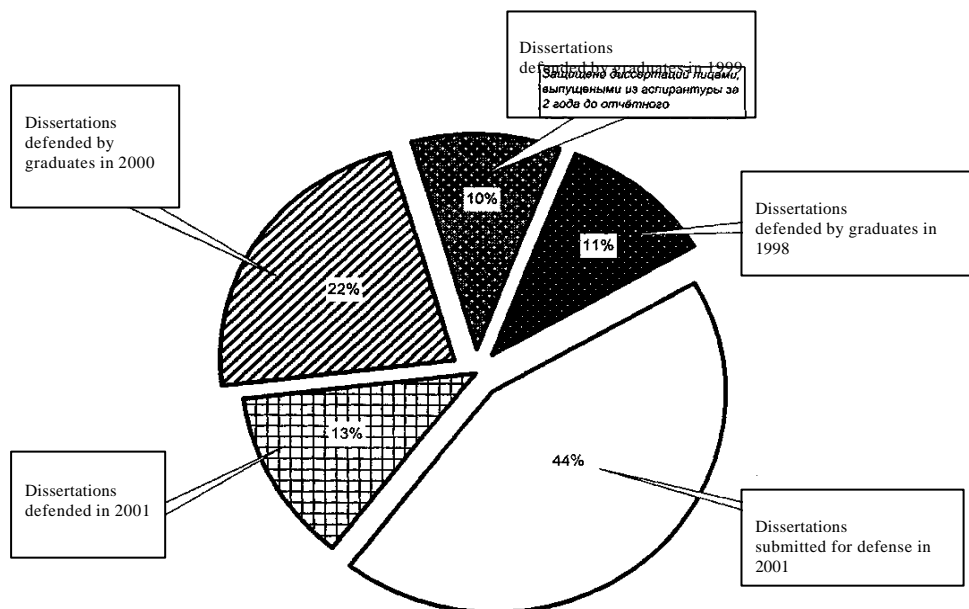
According to the Center for Sociological Research, few students (10 percent) consider that their future careers will involve them in research and teaching; however, more students (27 percent) are eager to continue their education in the form of postgraduate education. Certain distortions exist in the motivation of applicants. Some of the students (10 percent) drop out of their postgraduate programmes before completion (see Table 9). This figure suggests that the entrance quality assurance mechanisms are not perfect.

Table 9. Distribution of postgraduate students in institutions subordinated to the Ministry of Education (2001) (by tuition, in numbers)

Category of postgraduate students	Students – beginning of academic year		Enrolled		Changed form of training		Withdrawal before end of academic year		Graduation		Total students – end of academic year	
	Total	Full-time	Total	Full-time	From full-time to distance education	From distance education to full-time	Total	Full-time	Total	Full-time	Total	Full-time
Tuition waivers (funded from the Federal budget)	67,667	49,178	25,838	19,058	895	512	6,067	4,302	14,718	11,319	72,720	52,232
Contract-based (paying) postgraduate students	6,868	5,460	3,675	2,821	44	17	1,253	1,000	941	805	8,349	6,449
Total	74,535	54,638	29,513	21,879	939	529	7,320	5,302	15,659	12,124	81,069	58,681

Sources: Strikhanov and Mosicheva (2002).

Figure 9. Defended dissertations in institutions subordinated to the Ministry of Education, by year of graduation



Source: Strikhanov and Mosicheva (2002).

Postgraduate programmes require independent work on dissertations and imply a high degree of self-motivation on the part of the postgraduate students. There is, first of all, an annual evaluation of the *aspirant* by the department (laboratory, sector). He or she must present a report describing the progress being made in preparing the dissertation as well as in preparing for the candidate examinations. The research supervisor monitors the progress of the *aspirant* in fulfilling his or her individual plan.

These control mechanisms, which are rather formal, are not perfect. In some institutions, postgraduate students have heavy teaching loads. The work involved can influence the effectiveness and the quality of their dissertations. Consequently, the departments (laboratories, sectors) may pay less attention to the quality of the work of the *aspirants* during their attestations.

As a result, not all *aspirants* have sufficient time to write their dissertations. According to the Ministry of Education, in 2001, only 10 percent of *aspirants* ended their postgraduate course programmes with a dissertation defense. Some 44 percent submitted their dissertations for defense; 22 percent defended their dissertations one year after completion

of the course programme; 10 percent – in two years; 11 percent – in three years (State Committee for Statistics of the Russian Federation, 2002).

There are several completion levels of postgraduate course programmes, namely:

- with a dissertation defense;
- with submission of a dissertation;
- without submission of a dissertation.

The Dissertation Council is responsible for the quality and objectivity of the evaluation of the dissertation. The Council members must enforce high standards during the attestation. The Higher Certification Commission supervises the activity of the Dissertation Councils strictly, even dissolving them if the quality of their work is low.

The Formal Status of Doctoral Students and Post-Doctoral Employees (within the Higher Education Institutions, Academies of Sciences, and Industry)

Postgraduate study is implemented according to a budget and on a contractual basis (see Tables 7 and 9). Persons studying for a scientific degree retain the rights at their places of employment that they have acquired prior to admission to a Doctoral programme, as well as the right to return to their places of employment. Organizations, institutions, and enterprises are permitted to offer three to six months of vacation with the retaining of the salary (or leave without pay) to their employees, so that they may complete their Doctoral dissertations. Independent scientific trainees holding the Candidate degree, who are writing their Doctoral theses, may be transferred to positions of researchers for terms of up to two years. They also retain their official salaries and the right to return to their previous places of employment.

Full-time postgraduate students are provided with housing in a residence hall and a scholarship. Full-time male postgraduate students may receive a deferment from military service for their periods of study.

Postgraduate students and independent trainees (*soiskateli*) have the right to use laboratories, libraries, various types of equipment, and offices. They may be sent on business trips, and/or participate in research expeditions. Full-time postgraduate students also receive an additional grant for the acquisition of scientific literature.

To attract talented students, universities and research institutes have taken some creative steps. In certain Russian universities, one can find interesting examples of these efforts. Universities may set-up their own programmes for supporting young scientists (researchers). They may allocate grants for their research activities, add special bonuses to the salaries of active scientists (researchers), cover the costs of their training and participation in conferences, and provide assistance for the purchase of housing.

In universities, faculty members holding the Doctorate of Science receive salary bonuses that can be as high as 50 percent of base salary.

Recognition: Evaluation of Doctoral Degrees, Qualifications, and Titles Earned Abroad

The Presidium of the Higher Certification Commission evaluates foreign credentials to determine whether or not they are equivalent to Russian academic degrees. This procedure applies to foreign degrees issued in countries that have equivalence agreements with Russia. In such a case, the holder of the document or his or her organization must apply to the Higher Certification Commission as per the rules adopted by the Ministry of Education.

If the qualification has been awarded in a country that does not have a special agreement or contract with the Russian Federation, the holder of the academic title or his or her organization may apply to the Higher Certification Commission (Order No. 780 of the Ministry of Education of 16 May 2000) according to rules that have been adopted by the Ministry of Education.

Citizens of foreign countries are admitted to postgraduate courses or become independent research trainees on the basis of international agreements and contracts, and also on the basis of agreements made among higher education institutions and research organizations of the Russian Federation. People without citizenship are admitted to postgraduate courses or become independent research trainees if they can provide documents attesting the legality of their residence in the Russian Federation (Regulation No. 814 of the Ministry of Education of the Russian Federation of 27 March 1988).

Difficulties and Challenges Encountered by Students, Supervisors, and Higher Education Institutions

Years of reforms and of crisis have adversely affected faculty and researchers in Russian universities. Owing to very low salaries, a large number of talented professors have migrated to more economically developed countries, or left academe to take up employment in private business and in political and governmental structures. Most of the vacancies have been filled by less qualified faculty members unable to find other positions.

Because the Government could not pay faculty members adequately, it allowed people to be awarded academic titles without much effort on their part. Some took advantage of this situation. On occasion, some individuals have paid other persons to write Doctoral theses for them. Included in this group are people in business and in the Government. This practice has led to a devaluation of the Doctoral degree.

Given that, during the 1992-2001 period, the numbers of Doctors of Science doubled among the faculty and researchers in higher education organizations, one gets the impression that the Doctoral degree has become more prestigious today in Russia than in the past. Many long-term assistant professors, politicians, and heads of trade organizations have been awarded academic titles (Sheregi *et al.*, 2002).

Several factors have led to brain-drain in Russia:

- low wages;
- decline in the prestige of a research and teaching career;
- poor working conditions;
- lack of reliable databases and technical support;
- political instability in Russia;
- lack of respect for intellectual property rights;
- limited access of young talented scientists from the provinces to well-known research centers (Knyazev, 2001; Sheregi *et al.*, 2002).

The teaching staff is aging. Today the average age of the faculty in universities is 44.4 years. The average age of Doctors of Science is 58.2, and of Candidates of Science, 50.2 (Sheregi *et al.*, 2002; see also, Figure 10 and Table 10).

Table 10. Age structure of academic and administrative staff in higher education institutions subordinated to the Ministry of Education (in numbers, 2001)

Staff	Total	By age							
		Under 29	30 - 33	34-35	36 - 39	40 - 49	50 - 59	60 - 69	Over 70
Faculty, of which	181,250	26,250	11,830	9,194	13,917	41,047	40,937	30,367	7,708
- Doctor of Science degree	18,111	10	49	85	409	3,051	5,593	6,017	2,897
- Candidate of Science degree	85,798	4,491	4,844	3,862	6,445	21,995	23,124	17,660	3,377
Administrative staff, of which holders of	13,685	394	328	353	860	3,719	4,792	2,874	365
- Doctor of Science degree	3,283	2	2	10	66	599	1,278	1,155	171
- Candidate of Science degree	5,034	45	86	86	336	1,537	1,849	995	100

Source: Shlenov (2002).

The effectiveness and the quality of Doctoral programmes in Russia are influenced by several factors. Scarce research funding is a major drawback. The technical level of the infrastructure and the databases available for research are also critical factors.

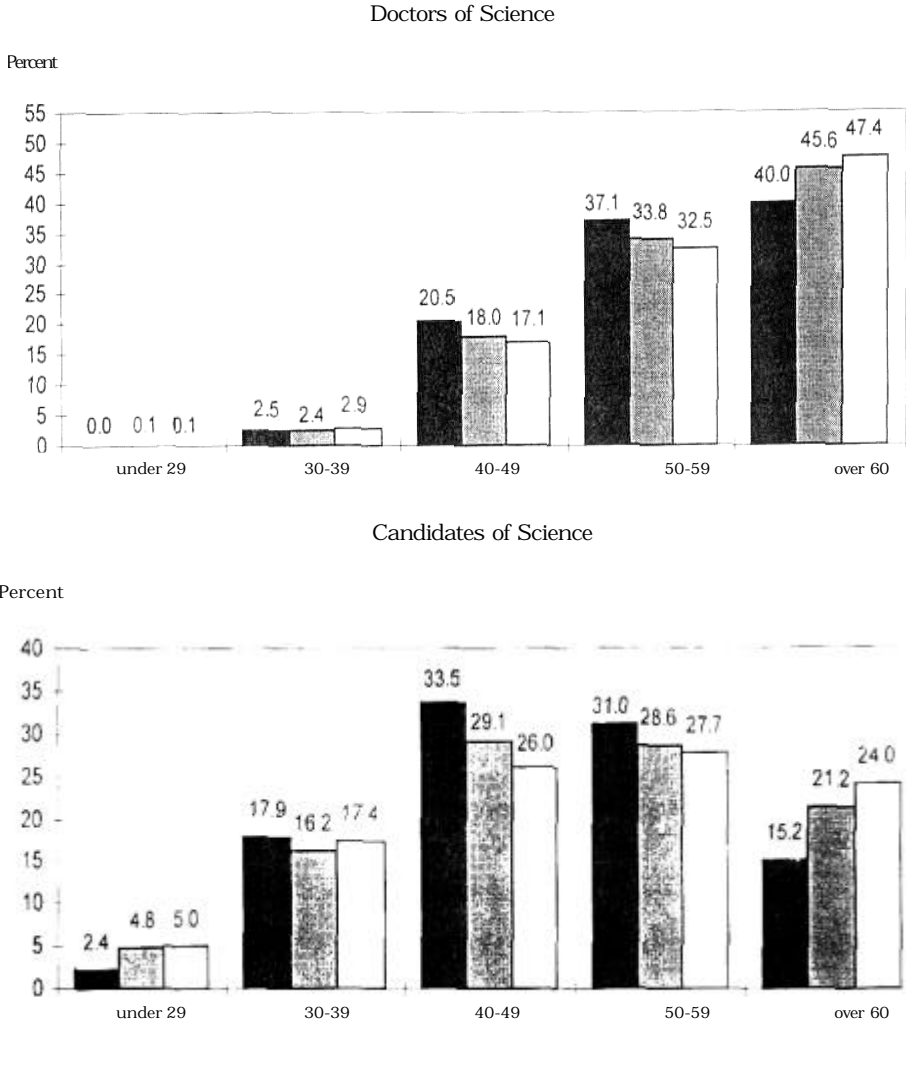
During the 1990s, the Government-allocated funding to the universities was spent for staff salaries and fellowships, only. Moreover, the employees of an institution who were not involved in the teaching process received only 10 to 12 percent of the official salary established by the Government, based upon their qualifications.

Although the situation has been changing for the better, many universities and research organizations offering postgraduate course programmes are still having serious problems. These problems include:

- shortages of computer and copying equipment;
- lack of access to the Internet for approximately one-third of the teachers;
- limited access to the electronic data bases of scientific information;

- absence of scientific literature in some fields;
- outmoded facilities;
- lack of the necessary technical supplies.

Figure 10. Age structure of Doctors of Science and Candidates of Science in institutions subordinated to the Ministry of Education (in percentages, 1997, 2002, and 2001)



Source: Shlenov (2003).

A survey sponsored by the Center for Sociological Research of the Ministry of Education and undertaken by the members of specialized Dissertation Councils in 108 universities identified the main reasons for

the decreasing quality of Doctoral theses. These include the inability of students to complete their theses in time owing to the weak experimental base, the use of old materials for the development of new themes, and lack of information about similar investigations being undertaken by Western scientists.

The majority of postgraduate students must engage in outside employment to support themselves. The jobs in question are usually unrelated to the research being undertaken. Thus, the students lack sufficient time and strength to devote to their actual studies.

In 2001, postgraduate students reported that their institutions only covered 36 percent of the costs of a Doctoral thesis. All other expenses (64 percent) were covered by the postgraduate students themselves. The proportion of the expenses to be covered are essentially a function of the type of research to be undertaken in the postgraduate course. As for the evaluation of the conditions of study and research in 2001, the postgraduate students evaluate them as satisfactory (3.5 on a five-point scale) (Sheregi *et al.*, 2002).

Among the reasons for the discontent of postgraduate students are the following:

- lack of assistance on the part of research supervisors;
- scarce technical equipment;
- research results cannot be tested;
- lack of access to scientific information;
- unavailable speciality literature.

Only 21.9 percent (in 2000) and 16.7 percent (in 2001) of the postgraduate students polled intended to become researchers after completing their studies. These figures are about half of what they were when the same students had been polled prior to beginning their postgraduate studies. Approximately 34.4 percent of the postgraduate students in 2000 and 33.3 percent (in 2001) would like to become professors. These figures are one-and-a-half times higher than those reflecting the views of postgraduate students before having enrolled in postgraduate courses. Nearly 30 percent of postgraduate students in 2001 did not know what kind of work they wanted to get involved in after graduation.

After graduation, nearly 60 percent of students intended to remain in Russia. About 16.7 percent of the postgraduate students intended to go to Western countries, and 22 percent had not yet reached a decision (Sheregi *et al.*, 2002).

A number of reasons have been cited by postgraduate students for not intending to become researchers. These include the low prestige of research, the irrelevance of the scientific themes developed by universities, scientific bureaucracy, obstacles to the application of scientific results, the low salaries of researchers, poor scientific communication, and poor social and working conditions.

Research in higher education institutions has suffered. Fundamental research has dropped from 40 percent in 1995 to 34.6 percent in 2002. The largest decrease in the amount of research has been in the fields of the Natural Sciences, technical and applied Sciences, Economics, and some complex fields. The decrease in the amount of research accomplished in the Humanities over the past four years has been much smaller (State Committee for Higher Education of the Russian Federation, 1995).

Entering postgraduate students face the prospect of having to earn two degrees, instead of one, as in Western countries. This requirement discourages good candidates from pursuing the Doctorate.

Privileges and Benefits: Academic Promotion and Entitlement to Future Employment in Higher Education Institutions, Academies of Science, and Industry

Professors carry-out activities that are closely related to their academic disciplines. Thus, they must write studies, articles, monographs, and textbooks, as well as supervise postgraduate students. An earned academic degree is a strong indicator of individual research orientation. For example, nearly 60 percent of the Doctors of Sciences are engaged in research. Such is not the case for personnel lacking an academic degree. For them, the figure is only 22 percent. About half (49.5 percent) of those involved in academic teaching started a career after having graduated from a postgraduate course programme.

As a rule, in order to begin an academic or administrative career in a university, an employee must be a Candidate or Doctor of Science-degree holder. The positions of Rector, Vice-Rector, and Head of Department may be occupied only by persons holding an advanced degree or title. Thus, the Charter of Kazan State University states that "the Head of faculty is elected on a competitive basis for a period of five years from among the most qualified and authoritative faculty of the higher education institute possessing the appropriate advanced degree or title. His or her election is approved by decree of the Rector" (Academic Council of Kazan State University, 2000). Most of the heads of universities and departments fall into the 40 to 69-year-old age group (83 percent). Those holding an academic degree (over 50 percent) represent the vast majority. In the under-40 age group, heads holding academic degrees make up 12 to 46 percent (see Tables 10 and 11).

The same age tendencies can be observed in the research institutes of the Russian Academy of Sciences.

In recent years, many persons have come to think that completion of the Candidate thesis does not help one's career. Still, many persons wish to pursue postgraduate education. The numbers of dissertation defenses have also increased from year to year. During the Soviet period, enrollment in postgraduate course programmes was viewed as being very prestigious. Science was generously funded, and Doctorate holders were guaranteed a successful career and a stable and high salary.

Table 11. Age structure of the academic and administrative personnel employed in research institutions and in research departments of higher education institutions (in numbers, 2001)

Staff	Total	By age							
		Under 29	30 – 33	34-35	36 – 39	40 – 49	50 – 59	60 – 69	Over 70
Administrative staff, of which holders of	3,124	205	61	66	184	763	1,108	662	75
- Doctor of Science degree	538	1	0	3	6	85	223	183	37
- Candidate of Science degree	1,217	29	20	21	62	312	477	270	26
Researchers, of which holders of	12,307	1,952	890	788	1,239	2,895	2,767	1,484	292
- Doctor of Science degree	645	0	1	3	19	114	233	186	89
- Candidate of Science degree	4,699	253	252	265	483	1,336	1,311	697	102
Specialists, of which holders of	10,299	2,524	927	960	1,043	9	14	6	0
- Doctor of Science degree	29	0	0	0	0	9	14	6	0
- Candidate of Science degree	266	13	8	34	37	58	80	20	6

Source: Ministry of Education of the Russian Federation (2002).

Nowadays, too, the prestige of holding a Doctorate has been rising. Many politicians and businessmen prepare and submit Doctoral theses. The reason for this practice is that people holding scientific degrees are held in high esteem. Politicians and businessmen, who received their diplomas of higher education during the Soviet period, have to contend with the young and energetic people who have studied at Harvard or Oxford, have been trained in the best research centers in Europe and the United States, who know several foreign languages, and have earned Master's degrees, MBAs, and PhDs. Members of the old guard are submitting theses in order to keep up with the realities and to avoid having to yield their positions.

In companies, an employee with an advanced degree is considered to be a highly qualified specialist. An earned Doctorate is a sign that the given employee has knowledge and qualifications. As a rule, these employees hold mid-level or senior management positions. As for Russian executives, their attitudes towards advanced degrees depend on their own knowledge. Leaders who have been academics consider study in a postgraduate course programme and the holding of a Doctorate to be an advantage. Leaders lacking advanced degrees do not pay attention to them. They believe that the professional experience and working abilities are more important than possession of an advanced degree. For career purposes, possession of an advanced degree will play a positive role only if the potential employee has had business experience (Cherepov, 2000).

Trends and Innovations in the Reform of Doctoral Studies

The Interagency Council on the Problems of Training Teachers and Researchers and of Postgraduate Professional Education was created in 2002. A goal of this Council is the strengthening of the system of postgraduate professional education and the forecast of the total numbers of postgraduate students and applicants for Doctoral education in given areas of science, so as to meet the needs of industry for highly qualified employees.

During the Soviet period, there were nearly 1,500 Dissertation Councils in the Russian Federation. After the disintegration of the Soviet Union, their numbers increased by 250 percent. Almost all Russian universities or academic institutes have their own Dissertation Councils that have been approved by the Higher Certification Commission (Filippov, 2000). In approximately 800 Dissertation Councils, however, only one or two dissertations have been defended each year. Based on an expert analysis of the activity involved in preparing highly qualified employees, a decision was taken, in 2000, by the Higher Certification Commission to reduce the number of Dissertation Councils. Nowadays, 2,307 Dissertation Councils are operating in the Russian Federation (Ministry of Education of the Russian Federation, 2002).

The Department of State Accreditation of Teachers and Scientists of the Ministry of Education has been preparing new candidate examination programmes. The new set of examinations includes nearly 524 new programmes that are essential for the integration of the basic requirements as to the level of knowledge of applicants for advanced degrees. This work is being undertaken by the expert councils of the Higher Certification Commission and by leading scientists from universities, academies of sciences, and scientific centers. Indeed, programmes for candidate examinations in foreign languages and in the History and Philosophy of Science have already been developed and are being discussed (Ministry of Education of the Russian Federation, 2003).

With the aim of strengthening State support for young Russian scientists holding a Doctorate degree as well as for their supervisors, Decree No. 267 of 13 March 2002 on the funding of 300 annual grants offered by the President of Russia was adopted. Scientists who have defended dissertations in the year preceding the Decree may apply for one of these grants. They are awarded by the Council of Grants of the President of Russia (Decision No. 554 of the Government of the Russian Federation of 24 July 2002).

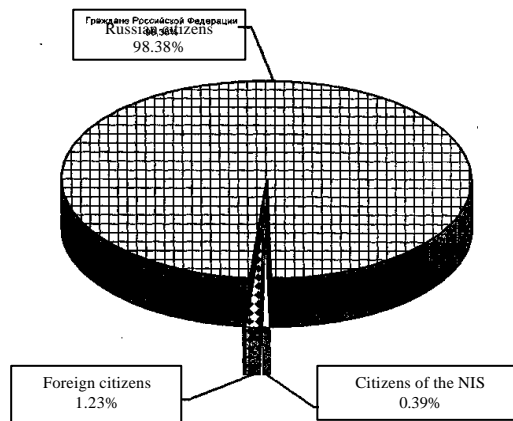
Since the beginning of the 1990s, international co-operation has become important for the renewal of Doctoral programmes in Russian higher education institutions and research organizations. Programmes run by DAAD (*Deutscher Akademischer Austausch Dienst* - German Academic Exchange Service), IREX (International Research and Exchanges Board), the Volkswagen Foundation, ACTR (American Councils for International Education), the European Union, various

agencies of the United States, and private funds, welfare funds, and organizations from other countries, have enabled thousands of Russian postgraduate and Doctoral students to establish co-operation with their colleagues in the leading scientific centers and universities in foreign countries, and to participate in international conferences and scientific training programmes.

Undoubtedly, some of the young scientists emigrated. Others, however, are returning to Russia. Science and education do not recognize borders. The academic community in Russia has been contending with this reality with increased insistence and has been pressing the Government to invest seriously in science and in the advanced training of scientific and institutional staff in Russia.

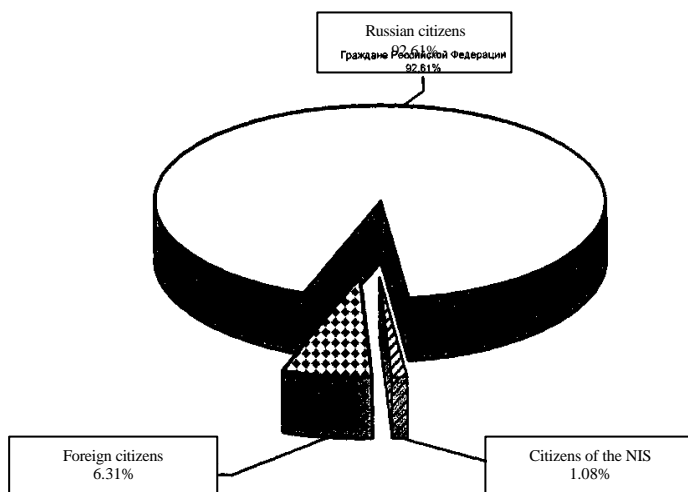
Today, there is particular concern for postgraduate students and the system of training of young scientists. They must all be supported by universities, scientific institutes, and regional governments. Among the priorities are the development and award of various types of grants and support for postgraduate students so as to create favourable conditions for the writing of dissertations. All these goals are identified with the aim of providing for the training of specialists in the leading scientific centers of the various regions of the country.

Figure 11. Percentages of tuition waivers for postgraduate students in institutions subordinated to the Ministry of Education, by citizenship (2001)



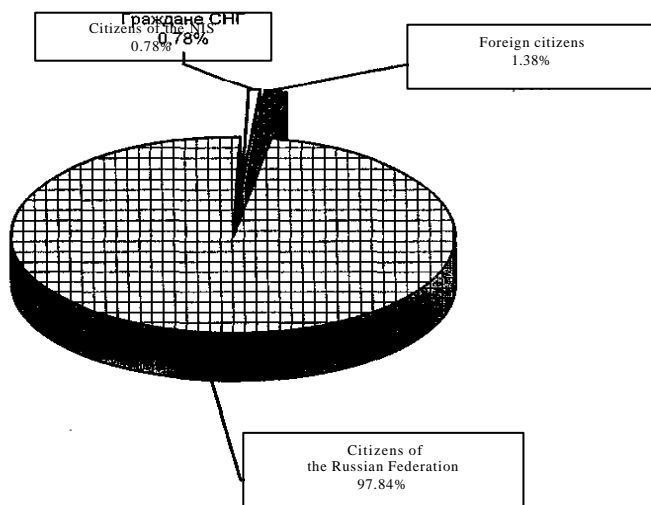
Source: Strikhanov and Mosicheva (2002).

Figure 12. Percentages of contract-based postgraduate students in institutions subordinated to the Ministry of Education, by citizenship (2001)



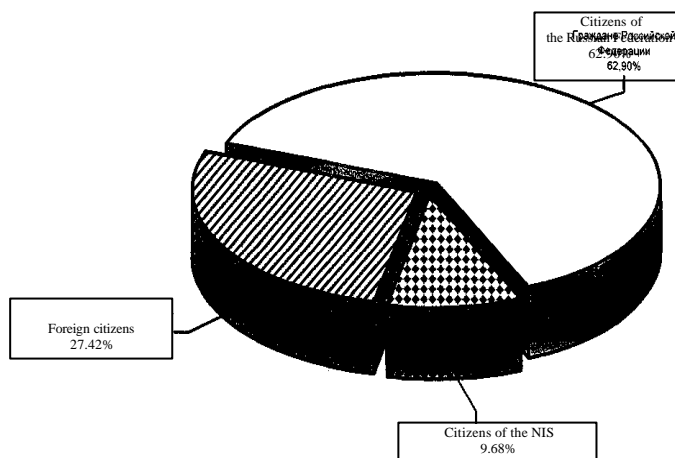
Source: Strikhanov and Mosicheva (2002).

Figure 13. Percentages of tuition waivers for Doctoral students in institutions subordinated to the Ministry of Education, by citizenship (2001)



Source: Strikhanov and Mosicheva (2002).

Figure 14. Percentages of contract-based Doctoral students in institutions subordinated to the Ministry of Education, by citizenship (2001)



Source: Strikhanov and Mosicheva (2002).

REFERENCES

- ACADEMIC COUNCIL OF KAZAN STATE UNIVERSITY. *The Charter of Kazan State University*. Rev. Ed., 2 November 2001. Amendments of 26 June 2003. Kazan: Website of Kazan State University <http://www.kcn.ru/tat_ru/universitet/ustav/index.htm>.
- CHEREPOV, S. "Defend Yourself, Sir". *Career Magazine* 9 (2000).
- "The Convention on the Recognition of Qualifications Concerning Higher Education in the European Region, Lisbon, 1997", in, *Materials of the All-Russia Meeting of the Heads of Regional and Inter-university Centers of International Co-operation and Academic Mobility, Vice-Rectors for International Relations on the Problems of Confirmation, Recognition, and Establishment of Equivalence of the Documents of Education and Training of International Offices' Staff*. Moscow: National Information Center of Academic Recognition and Mobility of the Ministry of Education, 2002.
- FILIPPOV, V. M. "Russian Education: Conditions, Problems, and Prospects". Report at the All-Russia Meeting of Academic Employees, The Kremlin, 14-15, January, 2000, Moscow, *Bulletin of the Ministry of Education* 2 (2000): 3.
- GOVERNMENT OF THE RUSSIAN FEDERATION. Order of the Russian Ministry of Education *About Preparation of Researchers and Faculty in the System of Vocational Training in the Russian Federation* of 16 March 2000. No.

780. Moscow: Website of the Ministry of Education, 2000. <http://www.edu.ru/db-mo/mo/Data/d_00/780.html>.
- GOVERNMENT OF THE RUSSIAN FEDERATION. Order of the Russian Ministry of Education *About Ratification of the Statute of a Dissertation Council, Instructions, and Forms of Documents* of 7 June 2000 No. 1707. Moscow: Website of the Ministry of Education, 2000 <http://www.edu.ru/db-mo/mo/Data/d_00/1707.html>.
- GOVERNMENT OF THE RUSSIAN FEDERATION. Order of the Russian Ministry of Education *About the Higher Certification Commission of the Russian Ministry of Education* of 11 April 2002. No. 1356. Moscow: Russian Education. Federal Portal: 2002. <<http://www.edu.ru/legal/public/default.asp?no=84523>>.
- GOVERNMENT OF THE RUSSIAN FEDERATION. "Decision of the Government of the Russian Federation *About Establishing the Unified Registry of Academic Degrees and Titles and Regulation on Conferring Academic Degrees*" of 30 January 2002, No. 74", *Rossiyskaya Gazeta* 22 2891 (6 February 2002).
- GOVERNMENT OF THE RUSSIAN FEDERATION. Decision of the Government of the Russian Federation *About the Procedure of Conferring Academic Titles* of 29 March 2002, No. 194. Moscow: Website of the Government of the Russian Federation, 2002 <<http://npa-gov.garweb.ru:8080/public/default.asp?no=84293>>
- GOVERNMENT OF THE RUSSIAN FEDERATION. Order of the Russian Ministry of Education *About the Procedure of Recognition and Establishment of Equivalence of Documents of Education and Academic Titles and Forms of Appropriate Certificates Issued by Foreign Countries* of 9 January 1997. No. 15. Moscow: Website of the Ministry of Education 1997 <http://www.edu.ru/db-mo/mo/Data/d_97/15.html>.
- KNYAZEV, E. A. "Definition of Positions and Goals (Kazan University's Mission and Policies)", in, KNYAZEV, E. A., ed. *Developing a Strategic Management Approach for Russian Universities*. Kazan: UNIPRESS, 2001.
- MINISTRY OF EDUCATION OF THE RUSSIAN FEDERATION. *Condition and the Basic Tendencies of the Development of the System of Education in 2001*. Analytical Report of the Russian Ministry of Education. Moscow: The Ministry of Education, 2002.
- MINISTRY OF EDUCATION OF THE RUSSIAN FEDERATION. *The Main Outcomes of the Activity of the System of Education in 2002 on the Realization of the Concept of Modernization of Russian Education for the Period up to 2010: Analytical Report*. Moscow: Website of the Ministry of Education, 2003 <<http://modern.ed.gov.ru/themes/basic/materials-document.asp?folder=1434&matID=1848>>.
- MINISTRY OF EDUCATION OF THE RUSSIAN FEDERATION. Order of the Russian Ministry of General and Professional Education *About Ratification of the Regulations of Preparation of Researchers and Faculty in the System of Postgraduate Professional Training in the Russian Federation* of 27

- March 1998. No. 814. Moscow: Website of the Ministry of Education, 1998 <http://www.edu.ru/db-mo/mo/Data/d_98/814.html>.
- MINISTRY OF SCIENCE AND TECHNOLOGY OF THE RUSSIAN FEDERATION. "Appendix to the Order of the Russian Ministry of Science and Technology 'About the Registry of Research Disciplines' of 25 January 2000, No. 17", in, B. A. RAIZBERG. *Dissertation and Academic Degree: A Handbook for Applicants*. Moscow: INFRA-M Publishing House, 2002.
- PRESIDENCY OF THE RUSSIAN FEDERATION. *Federal Law on Education* of 10 July 1992. No. 3266-1-FZ. Moscow: Website of the Ministry of Education, 1992 <<http://www.ed.gov.ru/ministry/pravo/z13883.html>>
- PRESIDENCY OF THE RUSSIAN FEDERATION. *Federal Law about Higher and Graduate Professional Education* of 22 August 1996. No. 125-FZ. Moscow: Website of the Ministry of Education, 1996 <<http://www.ed.gov.ru/ministry/pravo/fz125.html>>.
- RAIZBERG, B. A. *Dissertation and Academic Degree: A Handbook for Applicants*. Moscow: INFRA-M Publishing House, 2002.
- SHLENOV, U. V., ed. *Scientific Potential of Universities and Research Organizations Subordinated to the Russian Ministry of Education: Statistical Book 2001*. St. Petersburg: Severo-Zapadny Research Center of the Russian Ministry of Education, 2002.
- SHLENOV, U. V., ed. *Basic Figures for Research Activities of Universities and Scientific Organizations Subordinated to the Russian Ministry of Education: Statistical Book*. St. Petersburg: Severo-Zapadny Research Center of the Russian Ministry of Education, 2003.
- SHEREGI, F. E., DMITRIEV, N. M., AND AREFYEV, A. L., eds. *Scientific and Pedagogical Potential and Export of Academic Service of the Russian Universities [Sociological Analysis]*. Moscow: The Center for Social Forecasting, 2002.
- STATE COMMITTEE FOR STATISTICS OF THE RUSSIAN FEDERATION. *Science in Russia: The Statistical Book*. Moscow: "Russia's Statistics" Information Publishing Center, 2001.
- STATE COMMITTEE FOR STATISTICS OF THE RUSSIAN FEDERATION. *The Russian Statistical Yearbook: 2002*. Moscow: "Russia's Statistics" Information Publishing Center, 2002.
- STATE COMMITTEE FOR HIGHER EDUCATION OF THE RUSSIAN FEDERATION. *Decision of the State Committee for Higher Education of the Russian Federation "About Ratification of the Statute of the Master's Degree Preparation (Magistracy) in the System of Multilevel Higher Education of the Russian Federation"* of 10 August 1993. No. 42. Moscow: Russian Education: Federal Portal, 1993 <<http://www.edu.ru/legal/public/default.asp?no=72442>>.
- STATE COMMITTEE FOR HIGHER EDUCATION OF THE RUSSIAN FEDERATION. *Higher Education in Russia: Present Conditions and Prospects of Development*. Moscow: The State Committee for Higher Education of the Russian Federation, 1994.
- STATE COMMITTEE FOR HIGHER EDUCATION OF THE RUSSIAN FEDERATION. *Condition and Prospects of Fundamental Sciences in Universities: The*

Report on the Results of Sociological Research. Moscow: The Center for Sociological Research, 1995.

STRIKHANOV, M. N., and MOSICHEVA, I. A., eds. *The Statistical Book on the Activity of the Vocational Training System in 2001.* [Postgraduate Study and Doctoral Study in the System of the Russian Ministry of Education]. Moscow: RINKCE Publishing House, 2002.

TEREKHOV, A. I. Research Is the Lasting Value. Moscow: *The Bulletin of the Russian Academy of Sciences*, 7 (2002).

X. Spain

CARMEN RUIZ-RIVAS

1. GENERAL INFORMATION

Spain has a unitary system of higher education, the universities being the only institutions of higher education. The architecture of academic degrees has not yet been articulated as per an undergraduate and postgraduate (Bachelor's-Master's-Doctorate) phase, even though, recently, the Ministry of Education developed regulations necessary for adapting the Spanish system to the European Higher Education Area.

Degree Structure

The present situation does not fit well with the Bachelor's-Master's-Doctorate scheme, the main differences being manifest in the areas of postgraduate and undergraduate studies.

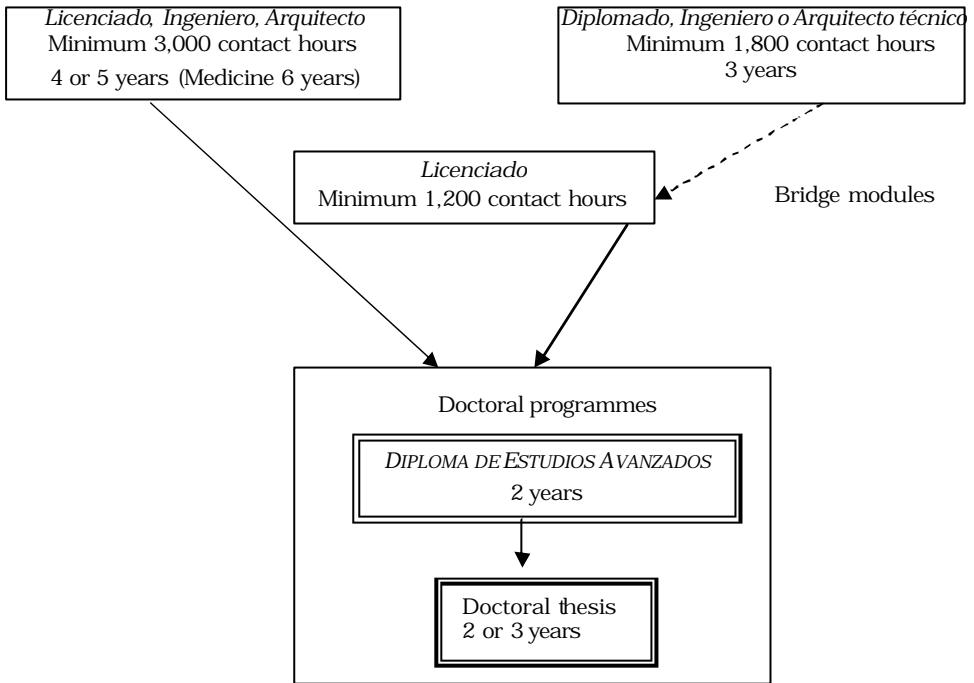
There exist two different types of first degree (the only ones that are officially relevant to the labour market):

- *Short-cycle degrees*: three years of professional orientation (nursing, short technical studies, and primary education teacher training, among others) without continuation into postgraduate studies. They do not provide access to Doctoral studies. The degrees in question are named *Diplomado*, *Ingeniero Técnico*, and *Arquitecto Técnico*;
- *Long-cycle degrees*: four, five, or six years (Medicine). They confer access to Doctoral studies. On average, the real duration is longer. The names of these degrees are *Licenciado*, *Ingeniero*, and *Arquitecto*. Students having earned a short cycle degree have the possibility of obtaining a *Licenciatura* through the completion of certain “bridging courses”.

Postgraduate studies (of the Master's degree type), that are oriented towards professional activities, are not State regulated. They are unofficial and are not exclusively offered by the universities. They are called *Títulos Propios*. They do not give access to Doctoral studies.

Research-oriented postgraduate studies are included in the Doctoral programmes. Doctoral programmes have two phases, the first two years giving access to the “Advanced Studies Diploma”. The Doctoral degree is awarded after the successful defense of a research thesis (usually two-to-three additional years).

Figure 1. Degree structure scheme in Spain



Source: The author.

Proposals made and more plausible perspectives (starting with the 2004-2005 academic year, with provisional activities in certain disciplines) call for a single first degree earned in three or four years (180-240 credits according to ECTS), a Master's degree after five or six years (60-120 credits according to ECTS), and a Doctorate after eight years, on average. The reform should be complete by 2010.

Universities, public or private, are the only institutions that award Doctoral degrees in Spain. University departments or research institutes recognized by universities organize the Doctoral programmes.

Quantitative Trends

Table 1. Students enrolled in Doctoral programmes in Spain (in numbers)

Academic year	Total	Public universities	Private universities
1990-1991	23,875	22,912	963
1995-1996	56,699	55,273	1,426
2000-2001	59,123	57,201	1,922

Source: Consejo de Coordinación Universitaria.

Table 2. Students having finished the first phase (DEA) (in numbers)

Year	Total	Public universities	Private universities
1990	N/A	N/A	N/A
1995	13,912	13,442	470
2000	19,324	18,461	863

Source: Consejo de Coordinación Universitaria.

Table 3. Numbers of Doctoral theses

Year	Total	Public universities	Private universities
1990	4,526	4,388	188
1995	5,926	5,618	308
2000	7,805	7,392	413

Source: Consejo de Coordinación Universitaria (2001).

Table 4. Numbers of universities

Year	Total	Public universities	Private universities
1990	40	36	4
1995	56	46	10
2000	68	50	18

Source: Consejo de Coordinación Universitaria.

From among the students enrolled in Doctoral programmes, women represent 51 percent and foreign nationals, 16 percent.

2. ORGANIZATION OF DOCTORAL STUDIES, EXAMINATIONS, AND PROCEDURES

Admission Standards/Criteria and Procedures

Doctoral programmes are proposed by university departments or research institutes and are approved by a Doctoral commission at university-level.

A student may obtain access to a programme of Doctoral studies when he or she has earned a *Licenciado*, *Ingeniero*, or *Arquitecto* degree or an equivalent foreign degree. Candidates must apply for admission to a Doctoral programme through the corresponding department or research institute.

Students from other Spanish or foreign universities who have accumulated credits in other postgraduate or Doctoral programmes may join a given Doctoral programme and have all or a part of their credits recognized, provided that they receive the approval of the department. Having earned a *Diploma of Advanced Studies*, a candidate may then write his or her thesis and earn his or her Doctoral degree in another university.

Once a student has been admitted to a programme by a department or a research institute, the administrative offices at the University will

formalize his or her enrollment within the period established by the academic calendar.

The department must nominate an advisor for each student. He or she must be a department member holding a Doctor's degree. To formalize his or her enrollment, each student is required to have received the approval of the advisor assigned to him or her by the department or institute.

To begin the second phase of a Doctoral programme (the research thesis), students must have the approval of a Doctorate holder (not necessarily a member of the department) who is to supervise the elaboration of the research (*Director de Tesis*) and to offer advice.

Students from other universities are not required to undertake the official transfer of their academic records in order to initiate Doctoral studies.

Evaluation of Foreign Qualifications with a View to Gaining Admission to or Continuing Doctoral Studies and Programmes

The first step is to obtain official validation of the foreign degree by the Spanish Ministry of Education as being equivalent to a *Licenciado*, an *Ingeniero*, or an *Arquitecto* degree. A validated Doctoral degree will have the same professional effects in Spain as that of any Spanish Doctoral degree.

Access to a Doctoral programme can be granted without the official validation of the foreign degree, provided that the Rector (or Doctoral Commission in some universities) decides to accept the qualification in question as being equivalent to a *Licenciado*, an *Ingeniero*, or an *Arquitecto* degree. In such cases, the decision of the Rector or the Doctoral Commission shall in no case imply the *official* validation of the foreign degree in question, and the Doctor's degree subsequently earned shall have no official validity in Spain until the previous degree has been officially validated by the Spanish Ministry of Education and Science as equivalent to a *Licenciado*, an *Ingeniero*, or an *Arquitecto*.

Upon enrollment, students must present the following documentation to the university:

- i. A request for recognition of studies undertaken, signed by the Doctoral Commission;
- ii. An original and a photocopy of a university degree certificate or an official academic certificate stating that the degree has been awarded;
- iii. An academic certificate of studies undertaken indicating the numbers of study years, the numbers of study hours involved, the courses taken, and the results obtained.

The competent authorities must officially accept all documents issued abroad that are presented upon enrollment. An official translation into Spanish may be required. Such documentation must also be legalized through diplomatic channels.

ECTS credits have not yet been established as an accumulation system in Spain. However, they are used as a transfer system for ERASMUS students. A decree establishing the new credit system has recently been approved and will apply to the new *curricula*.

A Master's degree undertaken abroad or a Doctoral programme offered by a foreign university may be transferred to a Spanish Doctoral programme if the respective academic structures coincide and the level of contents is relevant in the field of studies. The Doctoral Commission must approve the transfer following a positive report from the department or research institute in charge of the programme.

Legal/Academic Regulations on Doctoral Studies and/or Programmes Leading to Such Qualifications

At present, postgraduate studies are regulated by Royal Decree RD778/98 of 30 April 1998, BOE of 1 May 1998.

The aim of the first phase of a Doctoral programme is the specialization of the student within a specific field and his or her training in research techniques. Such programmes are carried out under the academic supervision and responsibility of a university department or a research institute.

In order to complete the first phase of a Doctoral programme, the student must have successfully taken a minimum of thirty-two Spanish credits (one Spanish credit having the equivalence of ten contact hours) distributed in the following manner:

An initial *teaching period*, in which the student must complete twenty Spanish credits. In all cases, at least, fifteen of these credits must correspond to fundamental modules or seminars.

A maximum of five complementary credits to be taken. These are credits not listed within the Doctoral programme. The authorization by the advisor must be given in order for the student to take complementary credits.

The first period of the programme will include the following:

- i.* Modules or seminars in fundamental areas of the scientific, technical, or artistic field of the programme.
- ii.* Modules or seminars relating to the methodology of and training in research techniques.
- iii.* Modules in areas related to the programme of interest to the candidate's thesis project.

During the second period, candidates will have to undertake a minimum of twelve Spanish credits through one or more *research assignments*. Access to this second period depends upon having successfully completed the first period.

– Evaluation of advanced studies and research aptitudes:

- As established by Decree 778/1998 of 30 April 1998, after a student has successfully completed his or her teaching and research training periods, research aptitude will be credited

through a public presentation before an examination board that evaluates the level of knowledge attained and the research undertaken by the candidate.

- Positive evaluation leads to the award of the *Diploma de Estudios Avanzados*.
- Time spent on Doctoral studies:
 - The first phase requires graduate students to carry out a minimum of two years of study in order to complete the programme.
- Qualifications:
 - Successful completion of the teaching period will give the candidate the right, after having paid the corresponding fees, to an *Accreditation Certificate* indicating that he or she has successfully completed the teaching period of the given Doctoral programme.
 - Successful completion of the evaluation of advanced studies guarantees the aptitude of the student for research who is awarded a *Diploma Accrediting the Level of Advanced Studies*.

Both the Certificate for the Teaching Period and the Diploma of Advanced Studies are certificates that can be awarded by any and all universities in Spain.

Tuition fees may be charged. The government of each autonomous region establishes annually its own fees for the academic services provided by the public universities.

Thesis (Dissertation) and Examination Requirements/Procedures of Evaluation/Final Defense/External Confirmation of the Degree/Title Requirements

An essential requirement to be met in order to initiate the preparation of a research thesis is that the candidate have successfully completed the credits and requirements of the Doctoral programme and obtained the Diploma of Advanced Studies. Moreover, the corresponding department must have approved the candidate's thesis project. The project is considered to have been approved when the candidate requests the registration of his or her Doctoral thesis project and the departmental steering committee complies with the request.

The following procedures are stipulated:

- The candidate must register his or her thesis project with the corresponding department.
- A Doctoral thesis consists of the results of original research related to the field of the Doctoral programme in which the candidate is enrolled. A Doctorate holder will supervise this work. If this person is not a member of the department, the department will appoint a tutor-in-representation within the department.
- There is no maximum limit by which time a thesis must be defended, neither continuing from the moment at which the Doctoral

courses were initiated, nor from the moment at which the thesis project was registered with the corresponding department.

- The thesis must be written in Spanish; however, the Doctoral Commission may authorize a written presentation in another language.
- As soon as the thesis has been completed, it must be deposited and officially registered, once the authorizations of the thesis director and of the department have been obtained.
- The candidate must deposit two copies of his or her thesis. Upon ascertaining the validity of the candidate's academic record and fulfillment of the requisites, a copy of the thesis will be processed for the department. The second will remain, temporarily, with the Doctoral Commission. This copy shall later be sent to the University library.
- Once the Doctoral Commission communicates the depositing of the thesis to all departments, any Doctorate holder may address any pertinent observations, within fifteen days, to the Doctoral Commission.
- Members of an examination board must be proposed and appointed. A process of publicity and admission, established by the Doctoral Commission, follows. The Doctoral Commission is also responsible for appointing the examination board, in accordance with the proposal presented by the department.
- The department will propose ten possible members to the Doctoral Commission, all of them Doctorate holders, in order to constitute the examination board. Each proposal must be accompanied by a report relative to the suitability of each one of the proposed members, signed by the Director of the Department.
- The Doctoral Commission will approve the composition of the examination board (five nominated members and two substitutes from among ten persons proposed) and will notify them of their appointments. The thesis director cannot be a member of the examination board.
- Transmitting the thesis to the examination board: Once the examination board has been appointed, the candidate will provide each member with a copy of the thesis and with a copy of his or her *curriculum vitae*.
- Within a maximum period of one month from the date of appointment, each member of the examination committee should send his or her report on the thesis to the Doctoral Commission.
- The Doctoral Commission will decide whether or not the thesis can be submitted to public defense and will communicate this decision to the department and the candidate.
- The candidate must present his or her thesis to the examination board in a public session held on the day and at the time settled with the board president. Each member of the examination board can ask any questions or make any comments related to the

research results obtained, and afterwards, the president of the board will permit any Doctorate holder in the audience to make comments or to ask questions.

- On concluding the thesis defense, the examination committee will award a grade. The grading system ranges from *No apto* (the degree is not awarded) to four levels of appreciation designating the award of the degree: *Aprobado*, *Notable*, *Sobresaliente*, and *Sobresaliente cum Laude*.
- The Doctoral diploma that is issued in accordance with current regulations shall be titled *Doctor por la Universidad...* (University Doctor...).
- The degree certificate lists the previously earned degrees held by the candidate as well as the university and place at which they were awarded, and the date of award.
- The Doctoral degree certificate also lists the Doctoral programme that the candidate has completed and the name of the department having offered the programme.

Quality Assurance Mechanisms and Procedures Related to Doctoral Studies

Currently, the quality evaluation of Doctoral studies in Spain is only an internal responsibility of universities. Nevertheless, the regional autonomous governments have conducted certain pilot activities.

Royal Decree 778/98 stipulates that Doctoral study programmes must be evaluated by the given Doctoral Commission appointed by the Rector, in compliance with the internal regulations of the universities. Each academic year, the Doctoral Commission approves the Doctoral programmes presented by the departments. Approval can be based on the evaluation of outcomes from previous submissions and on inputs.

According to the new Universities Law of December 2001 (*Ley Orgánica de Universidades - LOU*), accreditation is directly linked to university reform and aims at guaranteeing the quality, visibility, and credibility of the new degrees.

Following the adoption of the Universities Law, *Agencia Nacional de Evaluación - ANECA* (Quality Assurance National Agency) was created in 2003. It also carries out external evaluations.

The Quality Assurance National Agency has begun the process of evaluating and conferring quality ratings to Doctoral programmes that request evaluation on a voluntary basis. These can be programmes in public and private universities over the current academic year. Although this evaluation is not compulsory for universities, it will be required for them to obtain official grants. Successful evaluations will lead to the conferring of a "Quality Certificate" to those Doctoral programmes that will serve as confirmation, by an external body, that certain standards of quality have been met. It should also be mentioned that, in Spain, some autonomous regions have their own quality assurance systems and a regional agency for quality assessment.

Formal Status of Doctoral Students and Post-Doctoral Employees

Doctoral students are registered at their universities with all the rights and obligations pertaining to students. Applicants for a permanent position for both teaching and research at university level must hold a Doctoral degree.

Evaluation of Doctoral Degrees, Qualifications, and Titles Earned Abroad

In Spain, foreign degrees can be recognized nationwide, if, in general, they fulfill all legal requirements for nationally recognized degrees. The Ministry of Education, with the help of the *Consejo de Coordinación Universitaria*, is in charge of the national recognition of degrees obtained abroad.

A new decree that aims at facilitating the recognition of foreign degrees has recently been approved by the Government.

The universities sometimes assess and recognize parts of *curricula* taken abroad. In the case of joint programmes, the procedure may be simpler.

Spanish universities may conclude agreements with other national or foreign universities making provisions for integrated study programmes awarding either a single joint diploma or two separate degree certificates (a double degree).

The development of joint programmes and the award of joint degrees are legally possible, provided that the Ministry of Education approves them. At present, all the procedures for the award of joint degrees must comply with the same legal requirements as those applicable to national qualifications.

When a *curriculum* has been jointly developed and approved by partner institutions, recognition of parts of programmes undertaken at partner institutions is either automatic or provided for by inter-institutional agreements.

Doctoral students may have two supervisors in two different countries and pursue their studies part-time in both of them. Such arrangements are always made on a personal level. Students may receive a double degree awarded by both partners.

Doctoral students involved in mobility programmes (i.e., SOCRATES/ERASMUS) spend three- to six-month periods of study at their host institutions. They are not allowed to enroll at two institutions at the same time. They are only awarded the "home" qualification.

Students must spend at least a three-month period in another European university. They may write parts of their theses in a foreign language and have an international examination board with at least two members from two different countries, other than Spain.

Difficulties and Challenges Encountered by Students, Supervisors, and Higher Education Institutions

- Adaptation of current study programmes and new ones to be developed in accordance with the new university law.

- Improving the recognition procedures for foreign degrees.
- The non-existence of a tradition of evaluation and accreditation for postgraduate studies and the inertia of the system.
- The small impact of Doctoral degrees in professional practice. Doctoral degrees are essentially academic. More professionally-oriented Doctoral programmes should be developed.
- Although scholarships are made available by certain national and regional programmes, efforts need to be made to increase the numbers and the funding of grants in order to increase opportunities for studying at postgraduate level and to increase mobility.

Privileges and Benefits – Academic Promotion and Entitlement to Future Employment in Higher Education Institutions, Academies of Sciences, and Industry

A Doctoral degree is the first step in the development of an academic career at a university or at a research institution. In Spain, the holders of Doctorates have traditionally and primarily found their professional niches within the universities and in centers of research linked to Public Administration (the *Consejo Superior de Investigaciones Científicas*, for example).

Recent Trends and Innovations in Doctoral Studies, Including Incentives for Reforms

Spain took an important step forward by the adoption of the LOU in December 2001, that states, in a rather general way, that the “necessary measures to fully integrate the Spanish system into the European Higher Education Area” will be undertaken by the government, the autonomous regions, and the universities.

The law mentions the introduction of a new system of degrees and a system for its evaluation and accreditation along with the establishment of European credits (ECTS) and the Diploma Supplement, as useful tools for the process of adapting the Spanish university system to the European Higher Education Area.

In February 2003, the Ministry presented the frame of reference and the timetable with the details of the reform. The Rectors’ Conference and the *Consejo de Coordinación Universitaria* are, at present, analyzing the frame of reference and the decrees that will follow. Both institutions have welcomed the initiative, support its general principles, and have presented their conclusions.

In addition to the implementation of the ECTS and the Diploma Supplement, the main proposals regarding postgraduate studies are the following:

- The nation-wide introduction of a new university degree (the Master’s degree) that will follow a first degree. Master’s degree course programmes will have varied profiles. They will be professionally-

oriented, research-oriented, or a mixture of both. The duration could vary between 60 and 120 credits, according to the ECTS. The document emphasizes the importance of developing multi-disciplinary programmes and joint international projects at this level.

- The definition of Doctoral studies stresses that they are essentially devoted to research, through the elaboration of a Doctoral thesis that must include the results of original research.
- The development of a new regulation for Doctoral degrees that will facilitate the admission of foreign students, the development of joint research programmes, the professional recognition of Doctoral degrees, and the maintenance of the quality of postgraduate programmes.
- Access to Doctoral studies will be more flexible, opening them to students who have obtained a *licenciado* degree or an equivalent European Bachelor's degree and have accumulated a minimum of credits (60-90) in European postgraduate programmes.
- The establishment of regular and compulsory procedures for quality assurance and accreditation of study programmes.
- The development of scholarship programmes financed by the Ministry and the regional governments and the development of new programmes to support and promote the involvement of universities in the reform process.

XI. Sweden¹

HELENA MÄHLER

1. THE SYSTEM OF HIGHER EDUCATION

The main tasks of higher education institutions in Sweden are to provide education “based on science or art and on tested experience” and to pursue “research and artistic development and other development”. The institutions “shall also co-operate with the surrounding community and give information about their activities” (*Higher Education Act*, Chapter 1, Section 2).

In Sweden, higher education institutions are independent bodies. Higher education institutions have a relatively large amount of autonomy in the organization of studies, use of resources, and general organization. The same national legislation governs all higher education institutions, and all recognized higher education is funded by the State.

The diplomas awarded by all recognized higher education institutions have equal official value, and the basic principle is that students (with adequate qualifications) from all parts of the Swedish higher education system should be able to continue on into postgraduate education. Higher education in Sweden is free of charge to the student.

Swedish higher education institutions have many international contacts. Students, teachers, and researchers participate in exchange programmes or travel to foreign higher education institutions as free movers, and many foreign students come to Sweden. In 2002, approximately 900 Swedish postgraduate students traveled to another country to study for at least three months, and as many came to Sweden to pursue parts of their own postgraduate study programmes. Today, approximately 4 percent of all active Swedish postgraduate students study abroad during the academic year.

Most exchanges take place with countries in the European Union. Over 43 percent of the Swedish postgraduate students studying abroad and 40 percent of those coming to Sweden went to, or came from, another European Union country. The USA, however, is the individual country visited by most Swedish PhD students – about one in four PhD students who studied abroad during 2002 chose to pursue their studies in that country. The majority of Swedish postgraduate students who study abroad, and many foreign postgraduate students who come to Sweden, are active in the Engineering sciences or in Medicine (*Högskoleverket*, 2003d).

¹ The author would like to thank the following persons in the National Agency for Higher Education for their valuable support and input to this report: Helen Dryler, PhD; Jan-Åke Engström, PhD; Håkan Forsberg, PhD; and Lennart Ståhle, Head of the University Chancellor's Office.

The number of citizens from countries outside the Nordic countries and the European Union in Swedish postgraduate education increased during the 1990s. Their proportion, on the other hand, decreased. According to data from a 1998 NAHE report, foreign postgraduate students in Sweden are increasingly financed through postgraduate studentships or study grants (*Högskoleverket*, 1998).

Undergraduate education is provided in the form of courses, which may be linked together to constitute degree programmes with varying levels of individual choice. Students themselves, may also, combine different courses into a degree programme. The weight and extent of a programme of education or of a single course is measured in credits. One credit corresponds to one week of full-time study, and an academic year normally consists of forty credits, usually divided into two semesters. One credit corresponds to 1.5 ECTS credits.

In the Swedish higher education system, there are generally no intermediate qualifications. All degrees are regarded as terminal qualifications, even if there is a possibility to continue studying. Undergraduate degrees are divided into general degrees (*generella examina*) and professional degrees (*yrkesexamina*).

Two degrees are presently offered at the postgraduate level: the *licentiatexamen* (Licentiate degree) and the *doktorsexamen* (Doctorate or PhD). The Swedish term for education leading to either of these degrees is *forskarutbildning*. Literally, the term means “education for research”, but the generally accepted English translation is *postgraduate studies*. In this study, the terms, Doctoral education, postgraduate education, postgraduate training, and research training, are used synonymously as well. To denote the highest academic degree (*doktor*), both Doctorate and PhD are used.

Brief History of Postgraduate Education in Sweden

Until 1969, both Licentiate degrees and Doctorates were awarded in Sweden. A reform implemented in 1969 eliminated the Licentiate degree and the old Doctorate (*doktorsgrad*) and introduced a new PhD of 160 credits (four years of full-time study), including both a dissertation and taught courses. The previously differentiated grading system was replaced by the grades, Pass or Fail.

One of the aims of the reform was to shorten the period of study leading to a Doctorate and to lower the average age on graduation. The dissertation was no longer to be considered one’s “life’s work”, but was to be more of a test to demonstrate a person’s aptitude for independent research, with his or her main research career following after the examination instead of preceding it. There were also plans to increase the numbers of “career positions”, *i.e.*, positions intended mainly as the first career step for newly awarded PhDs.

In the early 1980s, the Licentiate degree was reintroduced owing to demand from business and industry for graduates with this qualification.

It has been claimed that the essential aims of the 1969 reform were not accomplished, in that the average period of study remained long, and that a significant proportion of one's research career still took place *before* the award of the Doctorate. Also, the number of post-Doctoral positions was never increased on the scale intended. Today, many people in the higher education community emphasize that there are still too few such positions available in higher education institutions. Positions for research assistants and post-Doctoral fellows are particularly scarce, above all in subject areas in which the availability of external financing is limited, for instance, in many smaller Humanities subjects.

Until the 1998 reform, mostly minor changes were made to the framework established in 1969. One important paradigm shift during this period, however, was that the once basically open admission to postgraduate programmes was gradually restricted, and faculties were enabled and, since 1998, required, to adapt admissions to the available resources.

THE 1998 REFORM

Recent years have witnessed one major reform concerning postgraduate education. The reform, built on the foundations of its predecessor of 1969, was implemented in 1998 and consisted of legislative changes that, in practice, made guaranteed financing during the entire postgraduate study period a prerequisite for admission. The bottom line is that admissions are to be adapted to the resources available:

- Only as many Doctoral students as can be offered supervision and otherwise acceptable conditions of study and whose studies have financing as directed in Section 3 shall be admitted to Doctoral studies (*Higher Education Ordinance*, Chapter 9, Section 1).

Moreover, increased emphasis was placed on the efficiency of postgraduate studies. In addition to the general study plan or syllabus for each subject in which postgraduate programmes were provided, it was prescribed that an individual study plan/syllabus be established for each student in order to give more structure to the individual study programme and to clarify the rights and obligations of the student, the supervisor, and the faculty.

Since the 1998 reform, the government has also stipulated quantitative goals for postgraduate education regarding the minimum number of postgraduate degrees awarded. Among the main reasons for this reform was the fact that, in some subjects, more postgraduate students were being admitted than could be offered acceptable conditions in terms of study financing, supervision, etc. The feeling was that overcrowding could lead to the prolongation of periods of study or, in some cases, to dropout. It was also felt that postgraduate education could not be considered a human right to be made available to all who were willing and sufficiently talented. Another rationale for the reform was the ambition to decrease the

time required for earning a postgraduate degree by making it financially possible for students to pursue their studies full-time or nearly full-time.

The current admission process has to include an assessment of whether or not the prospective student has secured funding, and only those who have done so may be admitted. The main sources of funding are either appointment to a postgraduate studentship or funding in the form of postgraduate study grants; however, there are also possibilities for admitting applicants who have certain other sources of funding for their studies (e.g., family resources or employment outside the higher education sector), if it is judged that this support can be ensured for the entire study period and that the applicant will be able to devote sufficient time for a minimum of half-time study.

A CRITICIZED REFORM

A great deal of criticism has been leveled at the 1998 reform, and several practical problems have surfaced since its implementation, e.g., Where should the responsibility for the continued funding of students lie once they are admitted? To what extent is the higher education institution responsible for the continued funding if the original funding of a student runs out before he or she can achieve the degree? And in what way does the financial situation of an applicant affect his or her chances of being admitted? Could a situation arise in which a less gifted applicant, who had the necessary funding, be admitted rather than a more talented person without funding?

According to an early evaluation of the reform, higher education institutions have varying views of their respective financial responsibilities in regard to postgraduate students. There are examples of institutions that consider the students to be ultimately responsible for financing their own studies, as well as those which view guaranteed financing of students admitted as a continuing responsibility of the institution (*Högskoleverket*, 1999).

Another consequence of the reform was that the numbers of postgraduate students decreased sharply in disciplines with reduced access to external funding sources, such as certain subjects in the Humanities and the Social Sciences. During the first years following the reform, several departments were virtually unable to admit any postgraduate students. In many cases, the results were smaller student groups. Critics have claimed that, for this reason, the reform threatens the academic "seminar culture" and the "critical mass" deemed necessary for high-quality postgraduate education.

Proponents of the reform emphasize that it has helped to make postgraduate education more efficient as well as more structured.

THE NATIONAL GRADUATE SCHOOLS

Another reform that has been taking place over the last few years is the introduction of National Graduate Schools (*forskaraskolor*, translated literally

as researcher schools). Since the 1980s, different forms of graduate schools have been initiated by individual higher education institutions, and the number of these schools increased significantly over the second half of the 1990s. However, the meaning of the concept has varied, depending on the goals and resources of the activities, and no national framework or agreed upon common structure for the schools exist.

In 2001, the Government established sixteen National Graduate Schools with different specializations (see Table 1, below). The rationale for this decision was that of testing different models of research training in order to promote recruitment to postgraduate studies and to increase their efficiency. According to the Government, the new Schools should be viewed as a complement to and a further development of postgraduate training. The National Graduate Schools began to enroll postgraduate students in the spring of 2001 and had almost 180 Doctoral students by spring 2002.

Each National Graduate School has a host institution and several partner institutions. The host institution bears the main responsibility for the programmes, the coordination, and the mission statement of the school. One of the aims of this form of organization is for the National Graduate Schools to promote co-operation among different higher education institutions and different research environments, especially among higher education institutions not having the right to award postgraduate degrees and institutions having this right.

Table 1. The sixteen Swedish National Graduate Schools

Mathematics and Computing (Uppsala University)	Management and Information Technology (Uppsala University)
Multidisciplinary Natural Sciences (Lund University)	History (Lund University)
Genomics and Bioinformatics (Göteborg University)	Language Technology (Göteborg University)
Genomics and Bioinformatics (Stockholm University)	Romance Languages (Stockholm University)
Education (Umeå University)	Gender Research (Umeå University)
Computer Science (Linköping University)	Science and Technology Education Research (Linköping University)
Healthcare Sciences (Karolinska Institute)	Teleinformatics (Royal Institute of Technology)
Space Technology (Luleå University)	Materials Science (Chalmers Institute of Technology)

Source: *Högskoleverket* (2003d).

Academic Titles

As stipulated in the *Higher Education Ordinance* (HEO), institutions of higher education may employ the following categories of teaching staff:

- *professor* (professor, including visiting professor);
- *lektor* (senior lecturer, including visiting senior lecturer);

- *adjunkt* (junior lecturer, including visiting junior lecturer);
- *forskarassistent* (research assistant);
- *timlärare* (part-time teacher); *gästlärare* (guest teacher);
- *biträdande lektor* (associate senior lecturer), but only within the framework of pilot projects.

In addition, the duties of postgraduate students often include a number of teaching hours, and there are also other categories of staff who have certain teaching responsibilities.

Further academic merits earned after the award of the PhD may lead to the title of *docent*, a quality marker indicating proven research proficiency and teaching skills. However, special positions for holders of this title no longer exist in the Swedish higher education system.

The required qualifications for higher education teachers are enumerated in national legislation. The keywords for most positions are academic skills (in artistic disciplines, the requirement is for *artistic* skills) and teaching skills, which are to be equally assessed.

The only position for which the regulations explicitly require the applicant to have a Doctorate or a corresponding qualification is employment as a research assistant (Post-Doctoral Fellow). In 2001, 93 percent of research assistants had a Doctorate or a Licentiate degree.

In the case of a senior lecturer, the requirement of an earned Doctorate is not absolute. HEO stipulates that alternative qualifications of importance for the subject area and duties associated with the position may be sufficient. In 2001, almost nine out of ten senior lecturers held a postgraduate degree.

Neither is an earned Doctorate a formal requirement for appointment as a professor. Nevertheless, professorships require a high level of academic/artistic as well as pedagogical skills and, in 2001, most professors (92 percent) had a postgraduate qualification, mainly a Doctorate (Statistics Sweden, 2002b).

PROFESSOR

The highest ranking teaching position in a higher education institution is that of a professor. In making the decision to appoint a person to a professorship, equal weight has to be given to the assessment of both teaching and academic skills.

SENIOR LECTURER

The basic requirement is a Doctorate or a corresponding academic qualification along with proven teaching skills. Alternatively, the candidate may have certain other professional skills relevant to the subject and the duties that the position will involve. In the assessment, equal weight is to be given to both teaching skills and academic/other skills.

ASSOCIATE SENIOR LECTURER

The requirement is a Doctorate or a corresponding foreign qualification. Priority is to be given to candidates awarded degrees no more than five years before the expiration of the application period.

JUNIOR LECTURER

The applicant is required to hold an undergraduate degree or possess corresponding qualifications. He or she must also have demonstrated teaching skills.

RESEARCH ASSISTANT/POST-DOCTORAL FELLOW

The requirement is for a Doctorate or a corresponding foreign qualification. A person who has been employed in this position for more than a total of three years may not be appointed to the same position again within the same or a similar subject area.

Since 1999, there are possibilities for qualified teachers, upon application, to be promoted to a higher ranking position in the same subject area and at the same higher education institution. The prerequisite for such a promotion is that the applicant be (or be about to be) permanently employed at a higher education institution, and have the necessary qualifications for the higher ranking position. A permanently employed senior lecturer may thus be promoted to a permanent position as a professor. Additionally, a person offered permanent employment as a senior lecturer may instead apply to be employed as a professor.

An adequately qualified junior lecturer may be promoted to a senior lecturer's position. Promotion can take place even if the qualification requirements are not fulfilled, if the applicant has demonstrated special teaching skills, special skills in developing and managing activities and staff, or a particular aptitude in interacting with the community.

2. INSTITUTIONS ENTITLED TO ORGANIZE POSTGRADUATE STUDIES AND TO AWARD THE CORRESPONDING DEGREES

Today, in Sweden, there are thirteen state universities, twenty-three state university colleges, and three non-state university colleges. In addition, a number of other non-state institutions have the right to award undergraduate degrees in certain specific subject areas.

Table 2 offers a list of the institutions that are authorized to award Doctoral degrees, either on a general basis or within one or more specific discipline(s).

Swedish universities are operated and financed by the state and have a *general* right to award postgraduate degrees, which means that they have the right to provide postgraduate education and to award postgraduate degrees in any subject.

Until 1996, the status of a university was dependent on the existence of at least three faculties, which were subject to decisions by the Parliament.

At that time, there were seven universities: at Uppsala, Lund, Göteborg, Stockholm, Umeå, and Linköping, plus the Swedish University of Agricultural Sciences.

Table 2. Swedish higher education institutions authorized to award Doctoral degrees

Uppsala University*	Royal Institute of Technology*	Blekinge Institute of Technology
Lund University*	Luleå University of Technology*	Malmö University College
Göteborg University*	Karlstad University*	Chalmers University of Technology*
Stockholm University*	Växjö University*	Stockholm School of Economics*
Umeå University*	Örebro University*	University College of Jönköping
Linköping University*	Swedish University of Agricultural Sciences*	University College of Kalmar
Karolinska Institute*	University College of Mälardalen	Mid-Sweden University College

Note: Institutions marked with an asterisk (*) may award the Doctorate on a general basis.

Source: Högskoleverket (2003d).

In 1997, the quantitative faculty requirement was withdrawn, and other higher education institutions were granted the right to apply to the Government for university status. Karolinska Institute, the Royal Institute of Technology, and Luleå University of Technology were given university status, even though they had already had the right to award postgraduate degrees. In 1999, the University Colleges at Karlstad, Växjö, and Örebro were elevated to university status. On 1 January, 2005, the University College of Middle Sweden is likely to become the fourteenth Swedish higher education institution to be awarded university status. Among the non-state higher education institutions, Chalmers University of Technology and the Stockholm School of Economics have been accorded the general right to award postgraduate degrees.

Higher education institutions that do not have university status are authorized to award Licentiates and Doctorates within the academic discipline(s) accredited at the institution.

The “discipline” concept has been used since 1999. It is utilized both as a marker to denote officially accredited research organizations in higher education institutions for statistical purposes and as a means for the allocation of funds for postgraduate education and research to non-university institutions. The *Higher Education Ordinance* stipulates that Doctoral studies be divided into four accredited disciplines (*vetenskapsområden*): Humanities/Social Sciences, Medicine, Natural Sciences, and Engineering Sciences. A fifth subject area, outside the formal “discipline” system, consists of the agriculture-related subjects at the Swedish University of Agricultural Sciences.

Accreditation of disciplines is granted by the Government, upon application by the higher education institutions concerned and after

evaluation by *Högskoleverket* (National Agency for Higher Education – NAHE).

In 1999, the University College of Kalmar received this type of accreditation for the Natural Sciences; the University College of Karlskrona/Ronneby (currently, the Blekinge Institute of Technology), for the Engineering Sciences; and the University College of Malmö, for Medicine. In 2001, the University College of Mälardalen was similarly accredited for Engineering, and the Mid-Sweden University College, for Natural Sciences. The University College of Jönköping has the right to award postgraduate degrees in four subjects in the Social Sciences and has applied to be accredited for disciplines in the Humanities and the Social Sciences.

Institutions not having the right to award postgraduate degrees may only provide postgraduate education in co-operation with an institution granted this right, for example, in the framework of a Graduate School.

3. QUALITY AUDIT AND EVALUATION OF POSTGRADUATE EDUCATION

National quality audits and evaluation of Swedish higher education are performed by the National Agency for Higher Education (NAHE), the central authority responsible, among other things, for the supervision of higher education in the country.

The quality of postgraduate education is regularly evaluated as part of recurrent and comprehensive subject and programme evaluations that have been undertaken since 2001. All subjects and programmes, including those at postgraduate level, are to be evaluated every six years. The evaluations are based on self-evaluations by the higher education institutions, external evaluations (by panels appointed for the evaluation of the specific subject or programme), and follow-ups. The panels not only include evaluators who are professionally active in higher education but also undergraduate and postgraduate students.

These evaluations are based on the goals and regulations laid down by legislation concerning higher education. As regards postgraduate education, the indicators used in the evaluations can be the following:

- number of postgraduate students in the department and their sources of funding;
- the organization of the postgraduate study programmes;
- teaching or other duties undertaken by postgraduate students;
- infrastructure, e.g., computers, library resources;
- use of courses, seminars, examination forms, etc.;
- academic supervision: resources and training of the supervisors;
- extent and organization of co-operation nationally, internationally, and on a multidisciplinary basis;
- results: number of dropouts and degrees, periods of study;
- labour market issues, e.g., the recruitment by the department of new Doctorate holders through the award of scholarships and the offering of post-Doctoral employment.

NAHE is also responsible for appraising the right of an institution to establish the officially designated disciplines (*vetenskapsområden*) for research and postgraduate training and, when applicable, the claim of the university to university status. The ultimate responsibility for decisions on such matters lies with the Government.

In the appraisal, several quality indicators are taken into account:

- The adequacy of the activities in terms of scope, enrollment of a certain number of students in more advanced undergraduate programmes, and adequate numbers of highly qualified teachers;
- The financial and academic viability of the institution as well as its attractiveness to students and teachers; satisfactory economic and infrastructural conditions;
- Sufficiently broad academic competency in the discipline and support from neighbouring subject areas; the institution to be part of a multifaceted national and international network.

4. REGULATIONS REGARDING DOCTORAL STUDIES AND PROGRAMMES

The two main sources of national regulations regarding postgraduate and Doctoral education are the *Higher Education Act* and the *Higher Education Ordinance*.²

Both undergraduate education and postgraduate studies are included in the overall legislative framework of higher education.

The general goals of higher education apply to both undergraduate and postgraduate education. In addition to knowledge and skills, students are expected to acquire a capacity for independent and critical judgment and the ability to solve problems independently, to exchange information at an academic level, and to follow the development of knowledge in the specific field of study. Postgraduate studies are also intended to provide the knowledge and skills necessary for undertaking independent research.

The legislation also lays down general rules about the disciplines in which postgraduate education is to be available and about which higher education institutions are to be allowed to award postgraduate degrees.

Detailed provisions can be found in the *Higher Education Ordinance* on the employment conditions of postgraduate students, *i.e.*, employment as the holder of a studentship (regarding the scope of departmental duties, terms of employment, financing, etc.). The rules also cover other types of employment that may be used to finance postgraduate studies, *i.e.*, work as assistants, teaching assistants, and clinical assistants.

The regulations governing Doctoral studies apply to their scope and duration, as well as to the right to have an academic supervisor and the content of the compulsory general syllabus of the postgraduate education

² Full texts in English are available on the Website of the Ministry for Education and Training <<http://www.education.ministry.se>>.

programme. The rules also prescribe that an individual syllabus be developed for each student.

Detailed regulations exist regarding examination requirements and procedures for the award of a Doctorate degree. The national regulations stipulate only the number of credits required for the award of a Licentiate degree.

Access and Eligibility

The main principle is that only as many students are to be admitted to postgraduate studies as can be offered supervision and acceptable conditions of study. Also, only applicants with assured funding throughout the duration of their studies may be admitted.

Admission requirements are divided into two sections. The first covers general eligibility together with any special eligibility requirements prescribed locally. The second is a judgment of the applicant's ability to benefit from the programme.

Higher education institutions may issue local regulations to supplement and to regulate implementation of the national higher education legislation. Local regulations include provisions, for instance, on the grading of theses (when applicable), course requirements, study breaks, application periods, special eligibility requirements, and matters relating to admissions. These local regulations must not conflict with the regulations and laws enacted at national level.

Admission regulations are laid down in the national legislation, *Higher Education Ordinance*.

Since January, 2001, institutions organizing postgraduate education are required to establish official admission procedures, covering rules to be applied locally, for instance, for applications, eligibility, and selection among applicants, as well as on how decisions on admission are to be made. Institutions are also obliged to ensure the access of applicants to the necessary information about available programmes, in particular regarding admission regulations. The purpose of the new procedures is to increase the transparency of the process as well as to strengthen the legal rights of students.

Applications are made directly to the department concerned. Increasingly, departments specify fixed application periods. Others still admit students on an ongoing basis, when a study grant becomes available, a studentship falls vacant, and supervisory capacity becomes available, or when applications are received from qualified students with access to external funding.

In 1998, new rules increased the responsibility of the higher education institutions for their postgraduate students, limiting the right to admit postgraduate students who had not ensured funding for all or most of their study periods. This reform is described above in greater detail.

In addition to ensured funding, the following eligibility requirements apply:

- i. General eligibility requirements stemming from the award of an undergraduate degree of at least 120 credits (three years of full-time study) or the equivalent level of knowledge;
- ii. Specific eligibility requirements when prescribed;
- iii. A requirement that the students have the ability required, in other respects, to pursue the programme successfully.

The specific eligibility requirements are determined by the Faculty Board and therefore vary both among subjects and among higher education institutions. These requirements often consist of knowledge gained from undergraduate studies, knowledge of other subjects, and professional experience.

If there are more eligible applicants than available study places, there has to be selection. Such selection must be based on the capacity of the applicants to benefit from the programme. Therefore, the previous academic achievements of applicants, including undergraduate degree projects or papers, are examined and assessed. In making the academic ranking, no account is to be taken of the financial situations of applicants.

Organization of Studies

There are two degrees in Swedish postgraduate education, the Licentiate and the Doctorate/PhD. The Doctorate is the highest ranked academic degree and requires the accumulation of at least 160 credits (the equivalent of four years of full-time study), of which the dissertation comprises at least eighty credits. A Licentiate degree consists of at least eighty credits, of which at least forty are awarded for a thesis that meets high academic standards.

The ultimate responsibility for postgraduate education lies with the relevant faculty board, but a great deal of the responsibility is frequently delegated to individual departments.

According to national regulations, general study plans or syllabi must be established for all subjects in which postgraduate education is provided. In addition, individual study plans/syllabi must be established for each student. Each individual plan must include a time schedule for courses and the production of a dissertation. It must list the obligations of the student and the supervisor and specify the ultimate goal/s of the study programme. The Faculty Board or the person(s) responsible for postgraduate education in the specific subject must approve the plan. It should also be reviewed every year.

Some would say that there is no such thing as a unified Swedish postgraduate system and that, in fact, there are as many different programmes as there are students. One reason for this statement is that many factors vary among departments, disciplines, and institutions, such as working conditions, organization of programmes, labour market prospects for those awarded postgraduate degrees, and how postgraduate students are viewed.

As regards the organization of studies, laboratory and non-laboratory subjects are usually organized quite differently. In many non-laboratory subjects, especially in the Humanities, the student's research is frequently a solitary endeavour resulting in a monograph. In laboratory subjects (as well as in certain subjects in the Social Sciences), students frequently form parts of research groups. The research of the individual student may be a component of a larger project and is frequently published in the form of scientific articles (to be included later on in the dissertation).

Nevertheless, there is a shared legal framework, and many factors are common to all postgraduate students, for example, dissertation work, cooperation with an academic supervisor, and the fact that taught courses (to varying extents) are included in the study programme. Most students also have some type of employment at their institution, frequently involving teaching at the undergraduate level.

One important element in postgraduate studies is academic supervision. All postgraduate students are entitled to one or more supervisor(s) during the "time deemed necessary" for completion of a postgraduate programme. Students are permitted to change supervisors, but it is also possible for the faculty board to withdraw the right to supervision in the case of a student who "materially neglects" his or her obligations. This sanction is rarely invoked.

Despite (or because of) the obvious importance of supervisors for the success of the work of students, they are not involved in the ultimate decision to pass or to fail their students. This decision is taken by an Examination Board (see below), which does not generally include the supervisor. The supervisor may, however, participate in the concluding meeting of the board, but without any right to participate in the decision to pass or not to pass the candidate.

5. FINANCIAL SUPPORT AND EMPLOYMENT STATUS OF POSTGRADUATE STUDENTS

To be a postgraduate student, one must be admitted to a postgraduate study programme. Since 1998, as stated above, guaranteed funding throughout the whole study period is a prerequisite for admission.

In the spring semester of 2001, approximately 18,000 individuals were actively taking part in postgraduate studies (active means devoting more than 10 percent of their work time to postgraduate studies).

There are different ways of funding postgraduate studies: appointment to a postgraduate studentship, the holding of some other post in higher education, the holding of a postgraduate study grant, or by means of "other funding".

The "other funding" category includes, for instance, regular state-guaranteed student loans, paid leave of absence from another employer, or scholarships. Departments are often hesitant to admit applicants with "other funding", especially when they claim that their funding comes from their families or from other private resources. In such cases, applicants are

frequently required to present an affidavit of support. Statements from employers are often more favourably considered than statements from private providers. There are, however, examples of students being admitted with only their parents or a partner as the financial sponsor(s).

The most common form of funding is appointment to a postgraduate studentship. In the spring semester of 2001, approximately 8,300 students (46 percent of the total number of postgraduate students) were funded in this way. Other common funding sources were study grants and employment in other positions at a higher education institution. In addition, many students were funded from outside the higher education sector, *e.g.*, through scholarships or a combination of studies and paid employment. Despite the more stringent rules on funding since 1998, a relatively large number of students, nevertheless, still lack organized funding either altogether or in part. This group includes many students in the Humanities and the Social Sciences.

The proportion of students appointed to postgraduate studentships varies among disciplines. Students in the Engineering Sciences, the Natural Sciences, and Mathematics are frequently employed in this way. In the Humanities and the Social Sciences, it is becoming more common for postgraduate students to receive student grants for their first two years and to be appointed to studentships for the last two years. This possibility arises because a grant is less costly than a studentship; thus, the faculties are able to maximize the number of postgraduate students within the available resources.

Appointment to a postgraduate studentship (employment as a Doctoral student) is the most secure way to fund postgraduate studies. Such students are formally employed and are thus covered by the same social insurance benefits as other employees in a higher education institution. This type of employment is financially more advantageous for the student than many other forms of funding, *e.g.*, student grants, and the guaranteed income probably has a significant impact on the likelihood of success in studies. Studentships may only be offered to students enrolled in postgraduate study programmes. They are tenable for four years in the case of full-time studies, but for no more than one year following completion of the degree programme.

Postgraduate students are expected to devote most of their time to their own studies, but departmental tasks, such as administration, teaching, or research, are often included in the duties associated with these positions. These duties may not exceed 20 percent of the normal workload, and the period of study may be prolonged proportionally.

As of May 2002, postgraduate students can apply to work part-time (not less than half-time) towards their degrees. This opportunity was created primarily to facilitate participation in postgraduate programmes for those already in the labour market.

The working hours of students holding postgraduate studentships are regulated insofar as there is a set number of hours per year and that the

student is entitled to a number of days off with pay, normally used in summer.

The monthly salary is usually between 16,000 and 21,000 SEK (approximately €1,700 – €2,300). The level is set locally in negotiations between trade union representatives and representatives of the higher education institutions. Most institutions have fixed salary scales for postgraduate students, which may also be used for students who are not members of a union. Once a student can prove that he or she has accumulated 80 and 120 credits, respectively, his or her salary is normally raised.

Apart from postgraduate studentships, other forms of employment in the higher education sector are available for postgraduate students:

Assistantships (*assistent*): part-time appointments that can only be offered to students holding a postgraduate study grant.

Clinical assistantships (*klinisk assistent*): either part-time or full-time appointments. Appointees must have completed a degree in Odontology or Medicine or be enrolled in a Doctoral programme in the Medical Sciences.

Extra hours: a common expression designating teachers paid on an hourly basis. This arrangement is often used when postgraduate students have undertaken more teaching than specified in their appointment conditions (*i.e.*, than is, in fact, permitted).

Study grants are another common means of funding postgraduate studies. The Government determines the monthly taxable amount to be awarded (currently 13,650 SEK, approximately €1,500), but it is paid locally, out of the faculty resources of the given institutions.

Grants are awarded for a maximum of twelve months at a time, after which a new application must be submitted. Students who have previously received a grant and have successfully pursued their studies will be given preferential consideration for a new grant. Grants may be awarded for a maximum of two years and five months, in the case of full-time studies. Students who have held a grant for two years can be offered employment at the given higher education institution in a postgraduate studentship for the remainder of their studies.

Frequently, students on study grants perform departmental duties, often in the framework of a part-time teaching assistantship and not exceeding 40 percent of a full workload.

Study grants alone do not entitle the holder to normal social insurance benefits and do not grant any formal right to summer holidays. Such rights are instead often specified in individual study plans.

Stakeholders outside the university frequently finance study grants, postgraduate appointments, and scholarships. Organizations offering such funding include Research Councils and foundations, sectoral organizations, and the business community. The award of a scholarship does not confer, to its beneficiary, most of the normally available social benefits.

Some postgraduate students hold positions in the private sector, being permitted by their employers to study while still drawing their salaries from the company, or to combine studies with their work.

6. EXAMINATION REQUIREMENTS AND PROCEDURES

In order to be awarded a Doctorate or a Licentiate degree, students are required both to pass the various course examinations that form part of the postgraduate programme and to produce an acceptable academic dissertation. Doctoral and Licentiate degree certificates are issued upon request.

The normative length of the study period for a Doctorate is four years; that for a Licentiate is two years, but not everyone manages to finish either degree within the prescribed period. An overly long period of study is a frequently cited problem of Doctoral studies in many countries. Sweden is no exception, and one of the aims of the 1998 postgraduate education reform was to reduce the amount of time these programmes would require for completion. In recent years, the net study period for a Doctorate has decreased and today amounts to less than four-and-a-half years. For a Licentiate, the average period is less than three years.

In 2002, the length of the average *net* study period (calculated as the *median* number of semesters) was 8.8 semesters, or close to 4.5 years. The average *gross* study period was twelve semesters, or six years, for both women and men. The duration of study for a Doctorate has been fairly constant during the last four years. For a Licentiate, the gross study period was seven semesters, or 3.5 years³ (*Högskoleverket*, 2003d). Average net and gross lengths of study for a Doctorate, by degree, in the spring semester of 2001, are listed in Table 3.

Table 3. Gross and net Doctoral study length, by degree (Spring semester 2001)

Degree	Gross study length			Net study length		
	Spring semester 2001			Spring semester 2001		
	All	Women	Men	All	Women	Men
PhD (Humanities and Social Sciences)	16	16	16	11.0	10.6	11.0
Doctor of Theology	16	..	16	10.5	..	9.5
Doctor of Law	16	16	..	12.0	12.0	..
PhD (Economics)	15	16	14	8.5	10.5	8.1
Doctor of Medical Science	10	10	9	6.4	7.1	5.3
PhD (Medicine)	10	10	10	8.7	8.3	8.8
PhD (Odontology)	15	11	15	8.2	8.3	5.3
PhD (Pharmacy)	14	..	12	8.7	..	8.3

³ The *net* length of study for a Doctorate or a Licentiate is calculated taking into account the activity rate of the student as a proportion of a full-time workload. The *gross* length of study denotes the number of semesters until the semester when the award of the degree takes place, starting with the first semester during which the student has an activity rate of at least 10 percent of a full-time workload (the gross period is calculated regardless of study breaks, lower activity rate than full-time, etc.).

Degree	Gross study length			Net study length		
	Spring semester 2001			Spring semester 2001		
	All	Women	Men	All	Women	Men
PhD (Natural Sciences)	12	12	12	8.8	8.8	8.7
PhD (Technology) [<i>Teknologie doktor</i>]	11	12	11	8.7	9.3	8.7
PhD (Technology) [<i>Filosofie doktor [tekn.]</i>]	10	10	10	7.7	7.2	8.2
Phd (Agriculture)	14	..	..	8.4	..	..
PhD (Forestry)	8	..	8	7.0	..	7.7
PhD (Veterinary Medicine)	9	..	..	7.9	..	..
PhD (University of Agricultural Sciences)	12	12	11	8.5	8.6	8.5

Source: National Agency for Higher Education (NAHE) Statistical Database.

The Licentiate Degree

It is possible to conclude postgraduate studies with the award of a Licentiate degree and, since May, 2002, institutions may admit applicants who only intend to earn this degree. Thus, the Licentiate can serve as a terminal degree, but it can also serve as a midway qualification on the path to a Doctorate. Roughly, one-quarter of those awarded Doctorates already have a Licentiate.

The Licentiate requires eighty earned credits, of which the thesis comprises at least forty. There are no national regulations that prescribe how Licentiate theses are to be examined. Custom dictates, however, that students seeking a Licentiate degree defend their work in a specially organized seminar. An examiner is required to scrutinize the thesis, and there is frequently an opponent as well as a more or less formal examination board.

The Doctorate

At least 160 credits are required for the award of a Doctorate, including a Doctoral dissertation of at least eighty credits as well as successful completion of the courses included in the study programme.

The Doctoral dissertation can take two forms: either as a monograph or as what is known as a composite dissertation, consisting of a number of published research papers and a summary. It may be produced by the student alone or in collaboration with another person. Dissertations must include a short abstract in English and a Swedish-language "popular science" abstract. The higher education institutions may prescribe locally in which languages, other than Swedish, dissertations may be written. These languages often include English, French, German, Norwegian, and Danish. English is very common, and, according to two different surveys, almost eight out of ten postgraduate students in the samples intended to write or were already writing their dissertations in English (SUHF, 1999; *Högskoleverket*, 2003a).

When the dissertation is complete, the time and place for the public defense is decided. The dissertation should be printed and available for scrutiny by the academic community and the general public at least three

weeks before the event. One way of fulfilling this requirement is to “post the thesis”. Previously, dissertations would be physically posted on the official notice board of the given higher education institution. Today, most departments merely post information about the time and place of the public defense.

The public defense procedure is oral and may be undertaken in a language other than Swedish, as prescribed locally. Prior to the defense, the faculty board appoints a chairperson, members of an examination board, and an opponent.

The opponent selected is someone who has an excellent command of the topic. Most institutions prescribe that the opponents have no links to the student, supervisor, or research project, and frequently also that he or she should come from another higher education institution, in Sweden or abroad. He or she is expected to thoroughly scrutinize the dissertation.

During the defense, the student is given the opportunity to report corrections in the dissertation. Then, the opponent and/or, in some cases, the student give(s) the overview of the topic and describes how his or her dissertation can contribute to the given field of knowledge. A discussion then takes place, with the opponent offering questions and views on the scientific relevance, methods, and results, and the student defending the work. Subsequently, members of the Examination Board may ask questions, and the floor is finally thrown open to questions from the audience.

The defense ceremony concludes with a meeting of the examination board, consisting of either three or five members, of whom at least one must be chosen from another higher education institution or another part of the faculty.

Dissertations are normally awarded one of two grades: “pass” or “fail”. It is very uncommon for a student to fail at this stage, since his or her academic supervisor is expected to have ensured that the thesis is of an acceptable quality before allowing him or her to go on to the public defense.

The official awards ceremony for Doctorates takes place once or twice a year. This academic celebration is a major one, at which all students who have completed their Doctorates at the higher education institution in question during the previous year receive their diploma and other insignia (a ring and a mortarboard or a laurel wreath) (*Högskoleverket*, 2003b).

7. EVALUATION OF FOREIGN QUALIFICATIONS

The overall system for the evaluation of qualifications from other countries for the purpose of gaining admission to or continuation of higher studies is decentralized and takes place upon application to the individual higher education institution. This procedure applies both to undergraduate and to postgraduate education.

On the other hand, the evaluation of *completed* academic qualifications, both undergraduate and postgraduate, is centralized and is undertaken by

the National Agency for Higher Education (NAHE). Doctoral degrees from other countries are usually evaluated as corresponding to a Swedish Doctorate. If there is a clear shortcoming in some respect, a foreign Doctorate may, in some cases, be assessed, instead, as the equivalent of a Swedish Licentiate degree. For example, certain subjects that were once politically defined in the former communist countries can create problems in this respect. A basic requirement for the evaluation of degrees is also that the research involved be open to public scrutiny and not have been kept secret, for example, in the case of certain defense-related subjects.

8. DIFFICULTIES AND CHALLENGES ENCOUNTERED BY STUDENTS, SUPERVISORS, AND INSTITUTIONS

Programme and subject evaluations during 2001 and 2002 have revealed that the conditions and organization of postgraduate programmes vary significantly among and within subjects in different higher education institutions. The differences are sometimes related to infrastructure, such as access to office space or a computer, but also relate to the organization of the study programmes. For example, the taught courses included in Doctoral programmes vary from forty to eighty credits, which means that in practice, some postgraduate students have less time for the preparation of their theses while others have additional time. Also, in many cases, postgraduate programmes are offered in research environments that are too small in terms of "critical mass" to maintain the required academic quality (*Högskoleverket*, 2002a and 2003c).

Teaching and other duties that are part of postgraduate studies are often a valuable experience for students. However, the teaching loads and other departmental duties of postgraduate students frequently exceed the prescribed maximum, which can lead to unnecessarily long study periods. In a study undertaken by the Swedish Association of Higher Education (SUHF, 1999), nearly half of a sampling of postgraduate students stated that the heavy workload was the reason for which their studies took longer than planned. Also, NAHE evaluations of subjects and programmes yield examples of postgraduate students whose teaching duties exceed the prescribed maximum of 20 percent of a full-time workload. Findings in the NAHE national survey of postgraduate students partly confirm the picture of the heavy workload of many students. One-third of the respondents claimed that their total workload (course work, departmental duties, and work on the dissertation) exceeded 50 hours per week. On the other hand, there were examples of postgraduate students, mainly in the Humanities and in Religious Studies, not having had any experience of teaching or other departmental work (*Högskoleverket*, 2003a).

In many subjects, relatively few students choose the higher levels of undergraduate study and even fewer go on to postgraduate education. This situation creates a possible dilemma for the future recruitment of teachers and researchers and may become a severe problem locally. It may prove to

be especially problematic considering the large number of teachers reaching retirement age in the decade to come.

Swedish postgraduate students generally tend not to change their higher education institutions, and most students continue on to postgraduate studies at the institution at which they completed their undergraduate degrees (even though doing so is not a requirement). Quality evaluations have shown that, in some subjects, departments even hesitate to admit postgraduate students from institutions other than their own.

Academic supervision is a vital part of postgraduate education. Several studies show that well-functioning co-operation with one's supervisor is the most important factor for study success. However, there are significant variations in how academic supervision is offered and the resources available. In many cases, the individual study plans devised for each student and that prescribe the time schedule for his or her work and the obligations of both supervisor and student do not fulfill their intended function and are not followed consistently and effectively.

It is not uncommon for problems to occur. The 1999 SUHF study reveals that almost 40 percent of the respondents claim that insufficient or otherwise unsatisfactory supervision prolonged their studies unnecessarily. The problems may consist of the supervisor's not devoting sufficient time or commitment to his or her supervisory tasks or that he or she is frequently unavailable to the student. Students are frequently strongly dependent on their supervisors, and, according to the 2003 NAHE survey of postgraduate students, one out of four students has either changed or seriously considered changing his or her supervisor.

From the supervisor's point of view, there may be, in some cases, a conflict between devoting adequate time and effort to one's postgraduate students and obtaining time and financial resources for one's own research.

Another difficulty is related to the supervisory capacity of the institution. In the Humanities and the Social Sciences, the capacity to admit additional postgraduate students frequently exists, both with regard to education and supervision as well as to the requests of prospective students. Often, however, the possibilities are limited by lack of financial resources. In the Engineering Sciences, it is frequently relatively easy to arrange funding, however, here, instead, a lack of supervisory capacity and/or students may impede the admission of new postgraduate students.

To professionalize academic supervision and to provide support for supervisors, many higher education institutions arrange introductory training courses for supervisors and set up "supervisor's associations", in which those new to the role may also participate. Many departments also appoint one or more assistant supervisors to supplement the competencies of the main supervisor and to give the student access to additional support.

In the Swedish higher education system, there is no intermediate level between undergraduate and postgraduate studies. Postgraduate students have to be admitted to study programmes at accredited higher education institutions. However, examples of departments that try to sidestep these

regulations can be found. These may attempt to introduce preparatory programmes or study periods of a different character between undergraduate studies and postgraduate programmes. Students who embark on such programmes in the hope of being admitted to a proper programme are most commonly found in the medical faculties. These so-called “shadow” postgraduate students are often very vulnerable, since they are frequently funded by scholarships, giving them neither the social insurance benefits of a postgraduate studentship nor the legal guarantees that accompany a study grant. In addition, there are no guarantees that the period of “shadow” postgraduate study will result in formal admission to a postgraduate programme.

National regulations (*Higher Education Ordinance*, 2003) do not permit higher education institutions to demand this kind of study from students in order to be admitted to postgraduate programmes, and several higher education institutions have also introduced local rules forbidding the practice.

9. QUANTITATIVE TRENDS

The numbers of persons choosing a postgraduate education programme have increased significantly over the past decade, peaking during the 1997-1998 academic year. The following years witnessed a relatively sharp decrease, caused by the more stringent regulations on financing, which were implemented in 1998. Nevertheless, the total numbers of entering postgraduate students expanded by about 35 percent during the 1990s.

Data concerning entering postgraduate students in 1990, 1995, and 2000 can be found in Table 4 below.

Table 4. Entering students in postgraduate education (in numbers)

Discipline	1990	1995	2000
Humanities/Social Sciences	690	922	638
Medicine	605	767	965
Natural Sciences	382	434	476
Engineering Sciences	537	756	830
University of Agricultural Sciences	97	145	136
Net total*	2,311	3,020	3,043

* Total sums may not add up since the figures refer to individuals who may in some cases be registered more than once.

Source: *Högskoleverkets databas för nationell uppföljning*.

The transfer rate from undergraduate to postgraduate education varies among subject areas. Mathematics and the Natural Sciences have the highest rate with more than one in three graduates opting for postgraduate studies, while few graduates in the nursing, teaching, and artistic subjects go on to the postgraduate level.

During five academic years, from the 1993-1994 academic year through the 1997-1998 academic year, a total of 158,403 persons completed an undergraduate degree. As of 2001-2002, 6.9 percent of these graduates had embarked on postgraduate programmes.

During the spring semester of 2001, approximately 18,000 persons were "active" postgraduate students, *i.e.*, were enrolled in at least 10 percent of a full-time study load. This figure represents an increase of approximately 5,000 students since the early 1990s. However, the increase has stagnated at roughly the same level as in 1998, when guaranteed financing became a requirement for admission to postgraduate studies. The numbers of active postgraduate students, in total and by discipline and national research subject area, as of the Autumn semesters of 1990, 1995, and 2000 are listed in Table 5 and 6.

Table 5. Active postgraduate students by discipline (data from the Autumn semesters of each year)

Discipline	1990	1995	2000
Humanities/Social Sciences	N/A	N/A	5,746
Medicine	N/A	N/A	4,674
Natural Sciences	N/A	N/A	2,482
Engineering Sciences	N/A	N/A	4,655
University of Agricultural Sciences	N/A	N/A	819
Net total*	13,249	15,524	18,337

* Total sums may not add up since the figures refer to individuals who may, in some cases, have been registered more than once.

N/A = Not available.

Source: Högskoleverkets databas för nationell uppföljning

Table 6. 1992–2001 active postgraduate students by national research subject area and by sex (data from the Autumn semesters of each year)

National research subject area	1992	1995	2000	2001
Humanities and Religious Studies	2,178	2,489	2,273	2,199
-women	965	1,170	1,159	1,139
-men	1,213	1,319	1,114	1,060
Legal Science and Law	173	172	168	165
-women	64	73	83	76
-men	109	99	85	89
Social Sciences	2,504	2,841	3,163	3,138
-women	1,005	1,242	1,520	1,558
-men	1,499	1,599	1,643	1,580
Mathematics	287	315	368	395
-women	45	54	68	96
-men	242	261	300	299
Natural Sciences	2,383	2,509	2,780	2,803
-women	787	899	1,134	1,169
-men	1,596	1,610	1,646	1,634
Engineering Sciences	2,912	3,222	4,212	4,363
-women	578	691	1,038	1,108
-men	2,334	2,531	3,180	3,255
Agriculture and Forestry, Landscape Architecture	345	432	436	409
-women	116	156	196	181
-men	229	276	240	228
Medicine	3,061	2,924	4,273	4,403
-women	1,221	1,255	2,391	2,524
-men	1,840	1,669	1,882	1,879
Odontology	195	198	160	142
-women	84	91	87	82
-men	111	107	73	60
Pharmacy	115	138	128	124
-women	58	81	83	77
-men	57	57	45	47

National research subject area	1992	1995	2000	2001
Veterinary Medicine	105	133	114	110
-women	51	79	79	75
-men	54	54	35	35
Other	157	201	293	339
-women	106	145	228	264
-men	51	56	65	75
Total	14,348	15,524	18,337	18,564
-total women	5,057	5,910	8,042	8,335
-total men	9,291	9,614	10,295	10,229

Source: Statistics Sweden (2003), *Statistical Report UF 21 SM 0301* (Table 3).

The 1990s witnessed more than a twofold increase in the numbers of postgraduate degrees awarded. The numbers of Doctorates almost doubled, and the numbers of Licentiates increased by 134 percent between 1990 and 2000. Tables 7 and 8, below, offer data on the total numbers of postgraduate degrees awarded in 1990, 1995, and 2000.

Table 7. Total degrees awarded (in numbers)

Type of degree	1990	1995	2000
Licentiate	429	750	1,004
Doctorate	1,095	1,520	2,182
Total	1,524	2,270	3,186

Source: *Högskoleverkets databas för nationell uppföljning*

Table 8. Awarded degrees by discipline and type of degree (in numbers)

Discipline	Degree	1990	1995	2000
Humanities/Social Sciences	Doctorates	250	331	498
<i>Humanities/Social Sciences</i>	<i>Licentiates</i>	<i>81</i>	<i>158</i>	<i>174</i>
Medicine	Doctorates	407	488	757
<i>Medicine</i>	<i>Licentiates</i>	<i>28</i>	<i>68</i>	<i>109</i>
Natural Sciences	Doctorates	214	297	354
<i>Natural Sciences</i>	<i>Licentiates</i>	<i>63</i>	<i>109</i>	<i>155</i>
Engineering Sciences	Doctorates	175	325	437
<i>Engineering Sciences</i>	<i>Licentiates</i>	<i>244</i>	<i>382</i>	<i>542</i>
University of Agricultural Sciences	Doctorates	49	79	136
<i>University of Agricultural Sciences</i>	<i>Licentiates</i>	<i>13</i>	<i>33</i>	<i>24</i>

Source: *Högskoleverkets databas för nationell uppföljning*

In 2000, almost 2,200 Doctorates and 1,000 Licentiates were awarded. Almost one-third of the Doctorates were awarded in Medicine. The second place in terms of numbers of degrees was occupied by the Humanities and the Social Sciences. Third place was occupied by the Engineering Sciences, and fourth place, by the Natural Sciences.

In 2002, women constituted 44 percent of those awarded a Doctorate. The proportion of women among those awarded a Doctoral degree has increased by almost 16 percent over the last decade. The highest percentage of women as Doctors is in the Medical disciplines. In the Humanities and the Social Sciences disciplines, the proportion of women is 48 percent. The lowest proportion of women is found in the Engineering disciplines. Of the Licentiate degrees awarded during 2002, 35 percent were awarded to women. The numbers of men and women awarded

Doctorates and Licentiates in the various research subject areas during the 1992-1993, 1994-1995, 2000-2001, and 2001-2002 academic years are listed in Tables 9 and 10 below.

Table 9. Numbers of Doctoral degrees awarded during the 1992-1993, 1994-1995, 2000-2001, and 2001-2002 academic years, by national research subject area and sex of recipients

National research subject area	1992- 1993	1994- 1995	2000- 2001	2001- 2002
Humanities and Religious Studies	117	114	227	261
-women	55	37	99	118
-men	62	77	128	143
Legal Sciences and Law	8	12	18	18
-women	2	3	9	7
-men	6	9	9	11
Social Sciences	136	182	323	375
-women	59	67	146	157
-men	77	115	177	218
Mathematics	27	26	44	41
-women	3	6	4	3
-men	24	20	40	38
Natural Sciences	234	351	424	431
-women	68	116	157	173
-men	166	235	267	258
Engineering Sciences	225	272	435	472
-women	36	44	96	112
-men	189	228	339	360
Agriculture and Forestry, Landscape Architecture	37	40	54	68
-women	9	14	19	29
-men	28	26	35	39
Medicine	378	442	737	696
-women	107	172	357	383
-men	271	270	380	313
Odontology	26	30	26	19
-women	6	17	13	11
-men	20	13	13	8
Pharmacy	4	14	25	21
-women	2	5	14	12
-men	2	9	11	9
Veterinary Medicine	15	18	29	20
-women	10	12	18	16
-men	5	6	11	4
Other	17	21	45	46
-women	9	16	37	33
-men	8	5	8	13
Total	1,224	1,522	2,387	2,468
-total women	366	509	969	1,054
-total men	858	1,013	1,418	1,414

N. B. The 1992-1993 academic year was two months shorter than the other academic years.
Source: Statistics Sweden (2003), *Statistical Report UF 21 SM 0301* (Table 8).

Table 10. Numbers of Licentiate degrees awarded during the 1992-1993, 1994-1995, 2000-2001, and 2001-2002 academic years, by national research subject area and by sex

National research subject area	1992-1993	1994-1995	2000-2001	2001-2002
Humanities and Religious Studies	29	55	51	50
-women	12	17	28	25
-men	17	38	23	35
Legal Sciences and Law	3	1	2	1
-women	2	-	1	-
-men	1	1	1	1
Social Sciences	68	114	112	109
-women	23	40	48	40
-men	45	74	64	69
Mathematics	23	29	35	35
-women	6	5	8	9
-men	17	24	27	26
Natural Sciences	90	98	185	211
-women	34	28	70	89
-men	56	70	115	122
Engineering Sciences	282	315	515	491
-women	41	60	125	111
-men	241	255	390	380
Agriculture and Forestry, Landscape Architecture	12	26	10	27
-women	3	7	4	12
-men	9	19	6	15
Medicine	31	45	96	111
-women	14	24	65	74
-men	17	21	31	37
Odontology	3	15	10	14
-women	-	7	6	8
-men	3	8	4	6
Pharmacy	1	6	2	2
-women	-	4	1	2
-men	1	2	1	-
Veterinary Medicine	4	1	5	1
-women	2	-	5	1
-men	2	1	-	-
Other	2	2	4	9
-women	-	2	4	8
-men	2	-	-	1
Total	548	707	1,027	1,061
-total women	137	194	365	379
-total men	411	513	662	682

N.B. The 1992-1993 academic year was two months shorter than the other academic years.
 Source: Statistics Sweden (2003), *Statistical Report UF 21 SM 0301* (Table 9).

As portrayed in Table 8, Licentiate degrees are most common in the field of Engineering. In this discipline, they made up more than half of the total number of Licentiate degrees awarded in 2000.

Over the last 20 years, the average age of those awarded Doctoral degrees has been fairly constant, between 35 and 36 years. The median age of recent Doctorate holders is found in Table 11 below.

Table 11. Average age of Doctorate recipients in the 1992-1993 and the 2001-2002 academic years, by degree designation and sex

Degree	1992-1993 academic year			2001-2002 academic year		
	All	Women	Men	All	Women	Men
PhD (Humanities and Social Sciences)	42	44	40	37	40	36
Doctor of Theology	41	..	41	43	46	41
Doctor of Laws	37	..	41	37	44	37
PhD (Economics)	35	..	34	34	36	34
Doctor of Medical Science	38	37	38	38	38	37
PhD (Medicine)	..	..	..	33	32	34
PhD (Odontology)	35	..	34	41	54	38
PhD (Pharmacy)	..	..	..	31	33	31
PhD (Natural Sciences)	32	32	32	32	32	32
PhD (Technology) [<i>Teknologie doktor</i>]	32	32	32	31	31	31
PhD (Technology) [<i>Filosofie doktor (tekn.)</i>]	35	34	36	31	32	31
Phd (Agriculture)	37	..	36	36	35	38
PhD (Forestry)	35	..	38	34	33	40
PhD (Veterinary Medicine)	38	39	..	36	33	..
PhD (University of Agricultural Sciences)	34	32	34	33	33	32
All	36	37	36	34	35	33

Source: Statistics Sweden (2003), *Statistical Report* UF 21 SM 0301, p. 26.

10. THE LABOUR MARKET FOR DEGREE HOLDERS

In Sweden, there are no formal employment privileges automatically associated with a Doctorate. Although most appointees to the higher ranking academic positions at higher education institutions hold postgraduate degrees, a Doctorate is not an absolute formal requirement for most positions. In general, there is also no automatic entitlement to employment outside the higher education sector, even if some employers may choose to fund Doctoral studies for an existing employee in order to offer him or her a higher ranking position after graduation.

Nevertheless, the Swedish labour market is generally favourable to holders of postgraduate degrees, compared to other groups. Graduates with a Licentiate or a Doctorate are generally employed sooner after finishing their degrees and stand a lower risk of unemployment than graduates holding only an undergraduate degree (Kim, 2000). However, there are probably variations, in this respect, among postgraduate degree holders.

Most postgraduate degree holders are employed in the public sector, especially in higher education. Data from 1996 indicate that 45 percent of all postgraduate degree holders were employed in higher education institutions, 30 percent in the rest of the public sector, and 25 percent in the private sector. Those employed in the private sector frequently work in research and development (Kim, 2000).

Today, approximately 55 percent of all teachers in higher education hold postgraduate degrees. Like in many other countries, the expansion of undergraduate programmes in the Swedish system of higher education has increased the need for highly qualified teaching staff. Also, the growing

numbers of teachers reaching retirement age will probably further increase the demand for Doctorate holders in the higher education sector.

Many newly awarded Doctorate holders choose to embark on a post-Doctoral period, in order to further enhance their research experience and qualifications, either abroad or in a Swedish institution.

Sweden has no comprehensive framework for post-Doctoral periods. In Sweden, new Doctorate holders can be employed as research assistants (post-Doctoral fellows), as researchers on temporary contracts within a specific project, and in other positions with teaching and/or research duties, for example, as a substitute teacher at a higher education institution.

There are no aggregate data on the total number of positions for new Doctorate holders that would qualify them for further employment career positions. The supply of such positions, in particular those of research assistants and post-Doctoral fellows, is often considered too low, especially in view of the already existing and projected future demand for holders of postgraduate degrees, such as higher education teaching staff. Lillemor Kim (2000), in assessing the number of positions for research assistants in relation to the number of both postgraduates and senior lecturers, estimates that the number of positions for research assistants is too low to provide either post-Doctoral employment for a sufficient number of new Doctorate holders or to serve as a recruitment base for senior lecturer positions, given that a selection takes place.

11. CONCLUDING REMARKS

Swedish postgraduate education (as well as undergraduate studies) have undergone both significant expansion and important reforms over the last decade. The number of postgraduate degrees has more than doubled. Stringent requirements for student funding have been imposed, and a new organizational form has been introduced for postgraduate education in the shape of the National Graduate Schools.

One initial effect of the 1998 funding reform was to slow down or to halt quantitative expansion, especially in certain subjects in the Humanities and the Social Sciences. Recent data indicate that, during the 2001-2002 academic year, there was, for the first time since the 1998 reform, a clear increase in the total numbers of entering postgraduate students. In 2001-2002, student numbers in the Social Sciences were also back to 1998 levels, and in the Humanities, student numbers have been slowly growing over the last few years, but were still lower than in 1998. Another effect of the reform was the increased responsibility of the higher education institutions for the conditions in which their postgraduate students study. Also, the proportion of postgraduate students with ensured study funding has increased since 1998.

The impact of the recently established National Graduate Schools is yet to be seen, but their aims include the promotion of the quality of postgraduate education and the furthering of co-operation among higher education institutions.

Recently, growing interest has been paid to postgraduate education, both as regards quantitative goals (in a situation in which there appears to be a growing demand for Doctorate holders outside the higher education sector), and the structure and form of the programmes, with greater emphasis being placed on increased efficiency through better organization and increased supervision. At national level, a major national survey of postgraduate students and postgraduate education, *A Mirror for Postgraduate Students*, was published in 2003 by the National Agency for Higher Education.

The primary purpose of the survey was to demonstrate whether and to what extent postgraduate programmes live up to their fundamental objectives from the student perspective. In addition, the survey was intended to provide a basis for a general discussion of how postgraduate studies function today, by focusing on how students view their own studies. Some results from the survey have been highlighted above.

Also, in 2002, the Swedish Government set up an official committee of inquiry to analyze and to evaluate issues relating to postgraduate education and the period following the Doctoral degree. In March, 2004, the committee submitted its report. The main proposals are summarized below.

- The committee emphasized that postgraduate education should prepare the student for work outside as well as within the higher education sector. According to the committee, this goal should be more clearly reflected in the goals for postgraduate education that are set on a national level.
- Admission to postgraduate education should be completely open and transparent. Selection among applicants should be made according to predetermined criteria, and all places should be openly declared vacant and be filled in an open process.
- The new Doctoral education proposed by the committee should require three-years of full-time study instead of the present four years. An integral part of a 3+2+3 degree structure, Doctoral education would follow after three years of undergraduate and two years of graduate (Master's degree) studies. The latter should be tailored to preparing the student for postgraduate study. The possibility for postgraduate students to do departmental work and proportionally extend their periods of study should remain.
- State funding for postgraduate education should be increased in order to strengthen quality. The allocation of funding should be based on the quantitative goals set by the Government for each higher education institution as well as on their results in terms of awarded degrees.
- Student funding should be strengthened. In principle, all Doctoral students should be employed by means of postgraduate studentships. The postgraduate study grant should be abolished, and institutions should not be allowed to offer scholarships instead

of employment to postgraduate students. However, according to the committee, the possibility for Doctoral students to use scholarships from other sources to finance their studies should remain.

- A greater number of graduate schools should be established, and a larger share of all Doctoral students should be given the opportunity to study in the framework of a graduate school.
- Academic supervision should be strengthened. All postgraduate students should be entitled to one main supervisor and at least one assistant supervisor. Also, all main supervisors should be required to undergo “supervisor training”.
- A new form of employment following the Doctoral degree, “Doctoral employment”, should be introduced to improve the possibilities for new Doctorate holders to obtain the necessary qualifications for a continued career in higher education.

The committee report is currently (May 2004) being considered by relevant public bodies and other groups, which will give their opinion, in writing, on the proposals before the Government will formulate a legislative proposal.

REFERENCES

- FORSKARUTBILDNINGsutredningen [Government Committee on Postgraduate Education] *En Ny Forskarutbildning: kraftsamling för excellens och tillväxt*. Betänkande av Forskarutbildningsutredningen, SoU 2004:27 [A New Doctoral Education: Report from the Government Committee on Postgraduate Education, Swedish Government Official Report 2004:27].
- FORSKNING OCH FÖRNYELSE, PROPOSITION 2000-2001:3 [Government Bill 2000-2001: 3, Research and Renewal].
- Higher Education Act* [English version].
- Higher Education Ordinance* [English version], revised 7 January 2003.
- HÖGSKOLEVERKET [National Agency for Higher Education] *Antagning till forskarutbildning* [Admission to Postgraduate Studies], Report No. 1999:15 R. Högskoleverket 1999.
- HÖGSKOLEVERKET. *Doktorander från länder utanför Norden och Europeiska unionen* [Postgraduate Students from Countries Outside the Nordic Countries and the European Union] Report no. 1998:40. Högskoleverket 1998.
- HÖGSKOLEVERKET. *Doktorandspegeln 2003* [A Mirror for Postgraduate Students, 2003] Report no. 2003:28 R, Högskoleverket 2003a.
- HÖGSKOLEVERKET. *Forskarskolor i Sverige - en sammanställning* [A survey of material on graduate schools in Sweden], Report no. 2001:12 R, 2001. Högskoleverket 2001.
- HÖGSKOLEVERKET. *Handbook for Postgraduate Students* <<http://www.doktorandhandboken.nu/english>> [accessed 17 October 2003]. Högskoleverket 2003b.
- HÖGSKOLEVERKET. *Hur har det gått? Högskoleverkets kvalitetsgranskningar 2001* [How Did Things Turn Out? The National Agency's Quality Audits and Evaluations, 2001]. Högskoleverket, 2002a.

- HÖGSKOLEVERKET. *Hur har det gått? Högskoleverkets kvalitetsgranskningar år 2002* [How Did Things Turn out? The National Agency's Quality Audits and Evaluations, 2002]. Högskoleverket 2003c.
- HÖGSKOLEVERKET. *Universitet och högskolor: Högskoleverkets årsrapport, 2002* [Swedish Universities and University Colleges Annual Report, 2002]. Short version in English available at <<http://www.hsv.se/english>>. Högskoleverket, 2002b.
- HÖGSKOLEVERKET. *Universitet och högskolor: Högskoleverkets årsrapport, 2003* [Swedish Universities and University Colleges Annual Report, 2003]. [Short version in English available at <<http://www.hsv.se/english>>]. Högskoleverket 2003d.
- HÖGSKOLEVERKETS DATABAS FÖR NATIONELL UPPFÖLJNING [National Agency for Higher Education Statistical Database] A large selection of data from the database is available on-line: <<http://nu.hsv.se/nu/index1.html>>.
- KIM, L. *Svensk forskarutbildning i internationell belysning* [Swedish Postgraduate Education in an International Perspective]. Documenta No. 70 Kungl. Vetenskapsakademien [Royal Swedish Academy of Sciences], 2000.
- KIM, L. *Lika olika. En jämförande studie av högre utbildning och forskning i de nordiska länderna* [Same but Different - A Comparative Study of Higher Education and Research in the Nordic Countries]. Rapport 2002 40 R. Högskoleverket, 2002.
- STATISTICS SWEDEN. *Postgraduate Education: First Time Postgraduate Students, Enrolled and Graduated Students in the Academic Year 2000-2001*. Statistical Report UF 21 SM 0201, 2002a.
- STATISTICS SWEDEN. *Universitet och högskolor - Personal vid universitet och högskolor, 2001* [Staff of Higher Education Institutions, 2001]. Statistical Report UF 23 SM 0201, 2002b.
- STATISTICS SWEDEN. *Universitet och högskolor. Forskarstuderande och examina i forskarutbildningen läsåret 2001/2002* [Higher Education. Graduate Students and Graduate Degrees Awarded in the Academic Year 2001/2002] Statistical Report UF 21 SM 0301, 2003.
- SVERIGES UNIVERSITETS - OCH HÖGSKOLEFÖRBUND [Association of Swedish Higher Education, SUHF]. *En genomlysning av svensk forskarutbildning* [Comprehensive Analysis of Swedish Research Education]. SUHF, 1999.
- ZETTERBLOM, G. *Forskarutbildningen under 70- och 80-talet: reformer och resultat* [Research Education during the 70s and 80s: Reforms and Results]. Stockholm: Carlssons bokförlag, 1994.

XII. The United Kingdom

JOHN TAYLOR

1. INTRODUCTION

During the 2001-2002 academic year, there were about 107,000 students studying for research degrees in the United Kingdom, forming just over 5 percent of the total British student population. This figure represents a major commitment to Doctoral education, the largest concentration of study at this level in Europe. Through the 1990s and into the new century, Doctoral education, like the whole of higher education in the United Kingdom, has undergone significant change and expansion. This study will look at the changes that have taken place and will examine some of the key issues now facing Doctoral studies in the United Kingdom.

2. KEY TRENDS IN DOCTORAL EDUCATION

Doctoral education in the United Kingdom has been transformed over the last thirty years. For the first twenty years of this period, the United Kingdom operated a binary system of higher education, with Doctoral studies based primarily (but not exclusively) in the university sector. In 1992, the former polytechnics, along with a number of former higher education colleges, were accorded university status, including the right to award Doctoral degrees. Before 1992, fewer than fifty universities had been enabled to award Doctoral degrees. Since 1992, over 100 universities have been enabled to award Doctoral degrees, along with other colleges that organize Doctoral studies with formal degrees awarded through accrediting universities. The expansion of Doctoral studies within the former polytechnics is central to many of the changes in Doctoral education in the United Kingdom and to much of the continuing debate on future arrangements for postgraduate research.

It is important to understand certain key trends in British Doctoral studies.

Student Numbers

Table 1 portrays the total number of Doctoral students in the United Kingdom. The growth in numbers is very significant: 220 percent over thirty years. In the early 1970s, Doctoral students represented almost 13 percent of the total university student population. Over the next twenty years, the United Kingdom witnessed a major shift from a highly élitist higher education system towards mass higher education, a trend which is continuing up to the present day. Thus, by 1994-1995, despite the significant growth in Doctoral activity, research students had declined as a proportion of the total population to about 5 percent. Since that time, the

expansion of Doctoral numbers has continued. As a proportion of the total population, Doctoral students have remained at about 5 percent.

Table 1. Total Doctoral students in the United Kingdom (in numbers)

Year	Doctoral students
1972-1973	33,740
1994-1995	86,960
2001-2002	106,995

Source: The author.

The fact that the proportion of Doctoral students has remained fairly stable over the past ten years is a little recognized, yet quite remarkable statistic. Throughout the 1990s, Government policy focused very strongly on undergraduate student expansion. Since 1997, this focus has been reinforced by a new Government determination to widen participation in higher education. Against this background and in the absence of explicit Government policy leadership, the fact that Doctoral numbers have increased and that these numbers, as a proportion of total numbers, have been maintained, says much for the vitality of Doctoral studies and the continuing demand from both students and prospective employers.

Table 2 portrays the mode of study for a Doctorate. The table shows clearly how thirty years ago most Doctoral candidates were full-time (almost 2:1) students. By the early 1990s, this figure had fallen to just over 50 percent, and the proportion is continuing to fall.

Table 2. Mode of study (in numbers and percentages)

Year	Full-time	%	Part-time	%	Total	%
1972-1973	22,060	65	11,680	35	33,740	100
1994-1995	44,740	51	42,220	49	86,960	100
2001-2002	53,925	50	53,070	50	106,995	100

Source: The author.

Put another way, whilst the numbers of full-time Doctoral students grew by 144 percent over the period, the numbers of part-time Doctoral students increased by a massive 354 percent. Much of the expansion in Doctoral studies, therefore, was among part-time students, those who combined study with a continuing career or with other activity.

Doctoral Students by Sex

Tables 3 and 4 portray the percentages of Doctoral students by sex. The changes are dramatic. Thirty years ago, Doctoral study in the United Kingdom was predominantly, almost exclusively, a man's activity. The expansion in the numbers of women as research students is very striking. They now represent over 40 percent of the total, and the numbers are still rising. Altogether, there are now 45,950 women enrolled as Doctoral students compared to 5,805 thirty years earlier, an increase of more than 700 percent.

Table 3. Full-time Doctoral students by sex (in numbers and percentages)

Year	Full-time students					
	Men	%	Women	%	Total	%
1972-1973	18,485	84	3,575	16	22,060	100
1994-1995	29,560	66	15,180	34	44,740	100
2001-2002	31,005	57	22,920	43	53,925	100

Source: The author.

Table 4. Part-time Doctoral students by sex (in numbers and percentages)

Year	Part-time students					
	Men	%	Women	%	Total	%
1972-1973	9,450	81	2,230	19	11,680	100
1994-1995	26,660	63	15,560	37	42,220	100
2001-2002	30,040	57	23,030	43	53,070	100

Source: The author.

It is very clear, therefore, that the expansion of Doctoral studies in the United Kingdom has been concentrated amongst women as well as amongst part-time students.

Further important changes in the pattern of Doctoral studies can be identified from a more detailed study of the pattern of student activity since 1994-1995. Changes in the subject classifications of students and in the methodology for compiling student numerical data preclude a longer-term study, but the conclusions still shed important light on trends in Doctoral studies in the United Kingdom.

Domestic and International Doctoral Students

Table 5 portrays the place of domicile of full-time Doctoral students in the United Kingdom. Significantly, the proportion of "home-based" Doctoral students has fallen from 64 percent to 56 percent in the period since 1994-1995. By contrast, the numbers and proportion of international students pursuing Doctoral studies in the United Kingdom have increased. Almost fifty percent of the full-time Doctoral students in the United Kingdom are now "international" students. The increasing numbers of students recruited from other European Union countries are especially apparent.

Table 5. Domicile of Doctoral students (in numbers and percentages)

Year	United Kingdom		Other: European Union		Other: International		Total	%
	Number	%	Number	%	Number	%		
1994-1995	28,495	64	3,620	8	12,625	28	44,740	100
2001-2002	30,410	56	6,975	13	16,540	31	53,925	100

Source: The author.

Not surprisingly, part-time Doctoral students are almost exclusively domiciled in the United Kingdom.

3. SUBJECT OF STUDY

Tables 6 and 7 portray the subject area of Doctoral research. So far as full-time students are concerned, it is clear that Doctoral studies are becoming more diverse in terms of subject area. In 1994-1995, 36 percent of all full-time Doctoral students were involved in the Physical Sciences (especially Chemistry and Physics) and in Engineering. Eight years later, these subjects represented 30 percent of full-time Doctoral students. By contrast, the numbers of Doctoral students in Medicine and the Biological Sciences, Computer Science, Business and Management, Social Sciences, Humanities, and the Arts were increasing.

Table 6. Subject-areas for full-time Doctoral studies (in numbers and percentages)

Subject areas	1994- 1995	%	2001- 2002	%	Percent change
Medicine and Odontology	2,353	5	3,645	7	55
Subjects related to Medicine	1,938	4	2,650	5	37
Biological Sciences	5,849	13	7,360	14	26
Veterinary Science	268	1	265	1	(1)
Agriculture and related subjects	1,008	2	830	1	(18)
Physical Sciences	8,177	18	8,260	15	1
Mathematical Sciences	1,492	3	1,520	3	2
Computer Science	1,558	3	2,190	4	41
Engineering and Technology	7,830	18	8,275	15	6
Architecture, Building, and Planning	601	2	815	2	36
Social, Economic, and Political Studies	3,757	8	4,995	9	33
Law	730	2	900	2	23
Business and Administrative Studies	1,405	3	2,020	4	44
Librarianship and Information Science	174	1	280	1	61
Languages	2,575	6	3,150	6	22
Humanities	2,696	6	3,425	6	27
Creative Arts and Design	557	1	1,210	2	117
Education	869	2	1,270	2	46
Combined	903	2	865	1	4
Total	44,740	100	53,925	100	21

Source: The author.

Table 7 portrays the numbers of part-time Doctoral students. Again, the relative decline of registrations in the Physical Sciences and Engineering is clear. By contrast, the expansion of Doctoral studies in the Social Sciences (especially Education) and in the Humanities and Arts is very clear.

Overall, therefore, the research student population of the United Kingdom is now more diverse than was the case in the early 1990s and before. In many universities, especially the older research-led institutions, Chemistry and Physics were noted for their relatively large clusters of Doctoral students. However, the Physical Sciences have been declining in relative importance, caused in part by the falling numbers of undergraduate students and by reductions in the numbers of Research Council grants.

Table 7. Subject areas of part-time Doctoral studies (in numbers and percentages)

Subject areas	1994-1995	%	2001-2002	%	Percent change
Medicine and Odontology	3,849	9	5,140	9	34
Subjects related to Medicine	1,806	5	3,100	6	72
Biological Sciences	4,293	10	4,975	9	16
Veterinary Science	200	1	190	1	(5)
Agriculture and related subjects	690	2	675	2	(2)
Physical Sciences	4,120	10	3,780	7	(8)
Mathematical Sciences	677	2	725	2	7
Computer Science	1,365	3	1,630	3	19
Engineering and Technology	5,773	14	5,825	10	1
Architecture, Building, and Planning	768	2	1,000	2	30
Social, Economic, and Political Studies	4,362	10	5,610	11	29
Law	644	2	995	2	55
Business and Administrative Studies	2,387	6	3,070	6	29
Librarianship and Information Science	236	1	395	1	67
Languages	2,676	6	3,685	7	38
Humanities	3,133	7	4,480	8	43
Creative Arts and Design	846	2	1,650	3	95
Education	3,146	7	5,215	9	66
Combined	1,249	3	930	2	(26)
Total	42,220	100	53,070	100	26

Source: The author.

Possibly more surprising, Engineering has also fallen in terms of the proportion of research student numbers, reflecting difficulties in recruitment at a time of strong employment prospects and good starting salaries for undergraduate students. These two subject groups, for so long the heartland of Doctoral studies in the United Kingdom, only increased from 25,900 students in 1994-1995 to 26,140 in 2001-2002 (1 percent) at a time when other subjects were emerging rapidly. Interestingly, growth was strongest in the Social Sciences and the Humanities. For many years, the shortage of funding opportunities has been blamed for difficulties in recruitment and low levels of research student activity in the Arts. However, between 1994-1995 and 2001-2002, the number of research students in Languages, Humanities, and Creative Arts and Design increased from 12,483 to 17,600, an increase of 41 percent. The subject balance within the British population of Doctoral students is therefore changing at the same time as overall numbers are expanding.

To summarize, it is possible to identify several important trends in Doctoral studies in the United Kingdom at the beginning of the Twenty-First Century:

- increasing student numbers;
- increasing diversity by subject of study;
- expansion in the recruitment of international students, especially from within the European Union;
- an increasing proportion of women as students;
- an increasing proportion of part-time students.

4. THE FURTHER DEVELOPMENT OF DOCTORAL STUDIES

Having outlined some of the key trends in Doctoral education in the United Kingdom, it is necessary to consider a number of the main issues that are currently shaping the further development of Doctoral studies. Five key issues will be explored:

- Student numbers
- Funding arrangements
- New forms of Doctoral studies
- Modes of delivery
- Quality matters

Student Numbers

As Government policy in the United Kingdom is placing an increasing emphasis on widening participation, especially for school-leavers, it is very unlikely that Doctoral students will represent a growing proportion of total student numbers. Indeed, the proportion may well decline slightly in the future. However, measured in absolute terms, it is likely that the number of postgraduate students will continue to increase. Demand for postgraduate study commonly reflects the position of the national economy and, in particular, the employment prospects for undergraduate students, but continued growth seems inevitable whatever the situation of the economy. There are several reasons underpinning this expansion:

- Continuing growth in undergraduate numbers that will place an increasing premium on postgraduate qualifications, including Doctoral studies;
- Increasing recognition by Government and employers of the contribution of postgraduate research to the economy;
- Increasing recruitment of international students, especially through the opening of new overseas markets;
- The globalization of higher education, including the development of international research programmes for Doctoral students.

However, there are also important issues to be addressed regarding the distribution of research student numbers by institution. Much of the expansion in activity has been in the “new” universities (the former polytechnics). However, they still represent a small proportion of the total activity of Doctoral studies. In 2001-2002, of 53,925 full-time Doctoral students studying in the United Kingdom, 48,025 (89 percent) were in the “old” (pre-1992) universities, 4,970 were in the “new” (post-1992) universities (9 percent), and 920 (2 percent) were in other institutions (mainly colleges of higher education). Even among the “old” universities there were wide differences. Table 8 portrays those institutions with over 1,000 full-time Doctoral students. These fourteen universities account for 46 percent of all full-time Doctoral students in the United Kingdom. The

largest provider among the “new” universities was Manchester Metropolitan University with 325 full-time Doctoral students, but nine universities had fewer than fifty full-time Doctoral students.

Table 8. Higher education institutions with over 1,000 full-time Doctoral students (in numbers, 2001-2002)

University	Full-time research students
Cambridge	3,935
Oxford	3,215
Birmingham	1,950
University College London	1,950
Imperial College London	1,800
Manchester	1,700
Sheffield	1,515
Nottingham	1,485
Edinburgh	1,460
Leeds	1,295
Southampton	1,245
Bristol	1,240
Glasgow	1,115
Newcastle	1,060

Source: The author.

Interestingly, whilst the “new” universities have established a strong reputation for widening participation and for developing new forms of access, it is clear that this effort has had little impact on Doctoral studies. Thus, of 53,070 part-time Doctoral students during the 2001-2002 academic year, 43,290 (82 percent) were in the “old” universities, 8,485 (16 percent) were in the “new” universities, and 1,295 (2 percent) were in other institutions.

Again, there are wide variations among institutions. Table 9 portrays those institutions with over 1,000 part-time Doctoral students.

Table 9. Institutions with over 1,000 part-time Doctoral students (in numbers, 2001-2002)

University	Part-time Doctoral students
Cambridge	2,080
Birmingham	1,900
Nottingham	1,680
Kings College London	1,555
Newcastle	1,460
Leeds	1,350
Sheffield	1,245
Edinburgh	1,235
Liverpool	1,210
Bristol	1,180
Oxford	1,100
Cardiff	1,010

Source: The author.

These twelve universities account for 32 percent of all part-time Doctoral students in the United Kingdom.

Part-time study is therefore more widely distributed than full-time study, but it is nonetheless very clear that Doctoral students are concentrated in the older, traditional research-based universities, and that even within the "old" universities there are wide variations, with the main concentration within the so-called Russell Group of leading research-driven universities (all the universities listed in Tables 8 and 9 are members of the Russell Group).

This pattern raises important issues regarding the future of Doctoral studies within the United Kingdom. On the one hand, one might argue that Doctoral studies should be concentrated in centers of research excellence, giving students access to the best facilities and staff expertise, providing a critical mass of Doctoral studies and opportunities for stimulating interaction among students, and offering operating efficiencies for funding bodies and institutions. *Prima facie*, there are grounds, therefore, for concentrating Doctoral studies in certain universities (in 2001-2002, there were Doctoral students in 147 separate institutions). On the other hand, one could argue that Doctoral studies benefit from a wide range of different approaches and opportunities, that "new" universities are developing their research profile (it is only ten years since they were allowed to award Doctoral degrees) and should be encouraged in this process, and that concentration can bring the risk of stagnation. This debate is a lively and on-going one in the United Kingdom and will be evoked again later in this paper. At its heart lies a fundamental question which is being pursued in the United Kingdom at present: Are Doctoral studies an essential feature of a university? Put another way, can an institution which does not offer Doctoral studies still present itself as a university? There may be, of course, very different answers to these questions, from a formal legislative perspective or through the perceptions of staff and students.

Other important factors are also now beginning to influence the numbers and distribution of Doctoral students. The first is the growing significance of regional policy in shaping higher education in the United Kingdom, in order to meet the needs of particular regional economies and local employers. Both the Higher Education Funding Councils (HEFCE) and the Regional Development Agencies are keen on ensuring the development of Doctoral studies in different geographical areas within the United Kingdom in order to stimulate new employment (either through the movement of companies so as to be close to centers of research and Doctoral studies or through the promotion of spin-off companies, some of which may be based on the innovations arising from Doctoral studies). A second area of expansion is numbers, which has already had a considerable impact in explaining the growth of activity in the 1990s. Increased expansion is likely to manifest itself through the emergence of new formats of Doctoral studies, especially the development of the so-called professional Doctorates. These are opening up entirely new student markets and have contributed significantly to the development of Doctoral studies in areas like Engineering, Education, and Management. A third

area of expansion is likely to be in those subject areas currently under-represented in Doctoral studies.

In the 2000 review of research undertaken by the Higher Education Funding Council for England, attention was drawn to the low numbers of Doctoral students in certain subject areas. This realization has led directly to the establishment of a Capability Fund to support the development of research, including Doctoral studies, in the following subject areas:

- Art and Design
- Communications, Cultural, and Media Studies
- Dance, Drama, and the Performing Arts
- Nursing
- Other studies and professions allied to Medicine (e.g., Physiotherapy, Occupational Therapy, and Speech Therapy)
- Sports - related studies

Funding Arrangements

Currently, higher education institutions in the United Kingdom receive funding for Doctoral students from two main sources:

- Block grant funding from the Government, allocated through the Higher Education Funding Councils;
- Fees normally paid by sponsoring bodies or by students themselves.

Block grant funding applies to British students only. At present, in England, first-year full-time research students and first- and second-year part-time research students are funded through the teaching formula of the Funding Council. The rationale for this arrangement is that, at this stage in their studies, Doctoral students are normally being trained in research methods rather than contributing to research output. In their second and third years, for full-time students, and third, fourth, fifth, and sixth years, for part-time students, Doctoral students are funded through the research model for QR (quality-related research) of the Funding Council, partly on a per capita basis (with a 1.75 multiplier to convert student years to the standard study norm of 3.5 years for full-time students) and partly through QR volume (weighted at 0.15 per full-time equivalent). Most important, QR funding applies with widely varying differentials and only to subject areas (units of assessment) with ratings of 4, 5 or 5* in the latest (2001) Research Assessment Exercise.

This last point is critical and means that, in practice, many departments in many universities are excluded from the block grant funding of Doctoral students arising from a quality judgment of their research activity. This situation does not preclude them from offering Doctoral studies, for which fees can be charged, but it certainly has a discouraging impact. To many observers, this arrangement is part of what is causing the increasing concentration of research activity and Doctoral studies in a small group of institutions.

The current arrangement for the block grant funding of Doctoral students therefore represents a highly complex amalgam of funding for teaching and research. However, this methodology is currently under review and can be expected to change in the future. The review of research undertaken by HEFCE in 2000 concluded that the funding provided by the HEFCE for the training of research students should be calculated and identified separately from the funding of research. In itself, this requirement may not seem particularly radical. However, the review went much further in raising the prospect that funding for research training could be concentrated in those departments able to demonstrate excellence in the field. In this way, the funding methodology could be used to implement a very significant reshaping of Doctoral studies in the United Kingdom. In the absence of block funding, some departments, even whole institutions, could be deterred from maintaining or developing Doctoral studies. Not surprisingly, the suggestions were greeted with horror by many institutions, especially the “new” universities. To many post-1992 institutions, the growth of Doctoral activity, even with relatively low student numbers, marked their arrival as “real” universities; moreover, such students have made an important contribution to research output, especially in certain newly emerging areas of study.

These fears have now intensified. In January 2003, in its White Paper, *The Future of Higher Education*, that set out proposals for higher education in England and Wales, the Government emphasized that institutions must meet minimum standards, for the training of PhD students before they would be eligible for Government funding. The Government was explicit in describing the possible consequences:

- This may lead to larger graduate schools in fewer higher education institutions as some institutions decide not to offer PhD places and others are in a position to play to their strengths in PhD training by expanding their postgraduate provision. In time, this might play into a model where postgraduate degree awarding powers are restricted to successful research consortia.
- Revised funding arrangements for Doctoral students will probably emerge before the end of 2003 and will be followed by a detailed period of consultation. A new methodology will probably be implemented as of 2003-2005. However, the decision to restrict QR funding to Grade 4, 5, and 5* units of assessment has effectively brought about a highly selective approach to the funding of Doctoral students. Despite the protestations of many universities, it is unlikely that this process will be reversed.
- Fees represent the second main source of income to universities in regard to Doctoral studies. Currently, a recommended fee for Doctoral students from the United Kingdom and the European Union is issued by the Department for Education and Skills. These fees are normally paid by sponsoring bodies (especially the six United Kingdom Research Councils) or by the students themselves. However, in practice, unlike

the fees charged for undergraduate students, universities are free to charge higher fees for Doctoral students if they so wish. For other, non-European Union, international students, universities are free to set their own fees. In the funding of higher education institutions in the United Kingdom that are undertaking Doctoral studies, therefore, there is clear scope for market forces to apply.

- The effects can be observed in two ways: by subject and by institution. At subject level, it is possible to charge higher fees in particular subject areas, often in those areas with a strong vocational overtone. At institutional level, many universities with leading research reputations are able to charge higher fees, commonly based on high ratings from the latest Research Assessment Exercise (RAE). Such competition in fees is increasingly prevalent for home and European Union students, but is especially apparent in the recruitment of non-European Union international students.
- Competition in fees for Doctoral studies is likely to become more intense in the years ahead, with increasing diversification in the market place. Many universities in the United Kingdom will only be able to charge the minimum recommended levels and may also resist increases, especially for part-time students, in order to maintain Doctoral studies (possibly in the absence of block grant support), to encourage wider participation, and to ensure that recruitment remains strong. At the other end of the market, however, it is likely that several universities will build on their research strengths by introducing higher fees. Within this group, it is possible that some degree of undercutting may occur, but, more likely, informal cartels may develop based on a common desire to raise the income necessary to ensure that international standards in research can be maintained. In this environment, it is certain that the years ahead will witness an increasingly competitive edge to the fixing of fees for Doctoral studies. It will no longer be true, as has been the case until recently, that Doctoral studies will cost the same in all universities in the United Kingdom.
- Across the United Kingdom, there is increasing competition to recruit research students. For leading research-led universities, increasing numbers of Doctoral students are important for supporting research activity and for confirming their national and international status in research. For the “new” universities, Doctoral students are vital for underpinning their emerging research base. Competition to attract students, both from the United Kingdom and from international markets, is now intense. Twenty or thirty years ago, the recruitment of Doctoral students was almost accidental. Usually, students were attracted to work with a particular individual or research group according to their interests. Today, universities have marketing and graduate recruitment offices. Advertising and promotional activities are widespread. The best undergraduate students are “groomed” for Doctoral studies from an early stage, and universities closely guard their potential students (in the past, it was commonplace for students

to pursue their Doctoral studies in institutions other than where they took their first degree in order to broaden their horizons). For the Doctoral student, there is now a greater array of fees, different ways to pay, and different expectations as to value for money (especially for self-financing students). Levels of market information are changing, with increased use of electronic media and web-based sources. Marketing devices are also emerging, such as scholarships and bursaries or a scholarship in the form of a “golden hello” to write off undergraduate debt. It is now necessary for potential Doctoral students to “shop around”, faced, as they are, by a range of choice unprecedented in higher education in the United Kingdom.

- For the institutions, more emphasis is being placed on the setting of appropriate fees for Doctoral studies, with a greater awareness of projected income and expenditure. Market segmentation will develop further. Flexibility in the setting of fees will also be increased, with discounts for particular sponsors or “package deals” (often including residential accommodation). British universities are not unfamiliar with such arrangements since they have been applied in international recruitment for many years, but they are likely to become familiar to all Doctoral students in the years ahead.
- Traditionally, one of the main constraints to Doctoral studies in the United Kingdom has been the lack of availability of student funding, either to meet fees or to meet personal living expenses. These difficulties remain. Indeed, in many subject areas, the number of awards for Doctoral studies has decreased. However, new forms of student funding also began to emerge in the 1990s. In particular, self-funding or partial self-funding became frequent. Many Doctoral students, having saved during employment and with an eye to further career development, are willing to pay for themselves, often with support from a partner or family. Loans to support Doctoral studies are now available. Many full-time Doctoral students, as well as their part-time counterparts, now combine paid work with research. Institutions have themselves assisted in this process, either through the provision of full or partial bursaries and scholarships, or by the provision of paid work, sometimes of an academic nature (part-time teaching or demonstrating) or sometimes of a non-academic kind (such as catering, cleaning, or security provision). Employers may also contribute to the costs of Doctoral studies, especially when the study is linked to career development.
- However, further changes are also taking place, often prompted by low levels of student demand for Doctoral studies in key areas. Thus, in Science and Engineering, where traditional student scholarships were often hopelessly inadequate compared with the salaries available in employment, the largest single funding body for British Doctoral students, the Engineering and Physical Sciences Research Council (EPSRC), has introduced a new funding mechanism for Doctoral accounts, which give universities freedom to vary payments to

students to reflect market conditions and differences among subject areas. The result may be fewer, but better-rewarded, research students. A similar theme was taken up in a report on the supply of scientists in the United Kingdom produced by Sir Gareth Roberts in 2002. This theme is repeated in the Government White Paper on Higher Education, which includes clear commitments to increased levels of personal funding for Doctoral students to a point that is competitive with employment and to enhance career development.

In order to attract the best students into postgraduate study, the Government has announced substantial increases in the stipend for Research Council-funded PhD students – from the 2003-2004 minimum of £9,000 to a £12,000 minimum by 2005-2006, with more in shortage subjects to raise the average still higher.

Taken together, these developments represent a significant change in Doctoral education in the United Kingdom. Expectations have changed. No longer is it possible to perceive Doctoral students as studying purely out of a sense of academic commitment and willingness to suffer financial adversity in pursuit of personal satisfaction. Rather, the need to provide enhanced funding to reflect the status of Doctoral students and their contributions to research is more widely recognized. Doctoral study is viewed less as a continuation of undergraduate work and more as a stepping stone to career development which requires and merits appropriate levels of reward.

New Forms of Doctoral Studies

One of the most interesting aspects of Doctoral studies in the United Kingdom in recent years has been the development of new formats for study. Traditionally, Doctoral studies meant the PhD, normally earned over three years for a full-time student and five or six years for part-time study, and culminating in a single research thesis. The emphasis has normally been on research achievement, with the PhD thesis representing an original contribution to knowledge.

In the 1990s, this view was increasingly challenged for several reasons:

- The relevance of the PhD was questioned by employers, many of whom argued that graduates did not possess the range of skills necessary for long-term career development.
- The financial difficulties facing universities in the 1980s and 1990s, and the consequent staff reductions, meant that the role of the PhD as the first stage towards an academic career was reduced.
- Completion rates among Doctoral students were often unsatisfactory, causing a re-appraisal of the format and purpose of the PhD degree.
- New subject areas emerged, especially in the professions, for which the traditional PhD was less appropriate.
- There was a need to face the growing demand for part-time study and the consequent need for more flexible forms of Doctoral programmes.

Against this background, an increasing emphasis has been placed on the role of the PhD as research training. PhD students in all universities in the United Kingdom now pursue formal training programmes in research methods, intended to provide a grounding in theory and techniques which will be of long-term value to them, beyond the completion of their PhD theses. Similarly, PhD students are now encouraged to acquire and to use a broad range of more generic skills. Students in given domains of study are increasingly studying alongside other Doctoral students from a wider range of disciplines. The single-subject isolation of research students has been questioned and reduced. Now, the emphasis is placed much more on a multi-disciplinary experience and on the development of life-long skills both relevant to the subject being studied but also of more general value, such as skills in technology, communication and languages, entrepreneurial skills, personal and presentational skills, and skills in teamwork, time management, and leadership. Much of this mix of subjects is unrecognizable when compared with the content and delivery of Doctoral studies in the 1970s and 1980s.

At the same time, a range of new formats of Doctoral studies has been developed.

- For full-time students, the PhD remains the most common format. However, in Engineering, supported by the EPSRC, a number of universities offer degrees of Doctor of Engineering (EngD). These are based on full-time programmes, lasting four years, based in some of the strongest departments, in terms of research, in the country. They vary from the PhD in that they involve close interaction with industry, including an industry-based research project, together with the development of a broad range of skills. Commonly, assessment will be on the basis of a portfolio of research projects rather than on a single thesis.
- In a similar way, in 2001, ten leading research-based universities, with Government support, launched the New Route PhD. Now taken up by over thirty universities, this scheme is a four-year integrated Doctoral programme combining one-to-one academic supervision with group work, lectures, and tutorials. Students combine formal coursework in the subject area, training in a broad range of research and professional skills, and a specific research project. Approximately 40 percent of the programme consists of taught material with 60 percent consisting of general and specific research training and a thesis. The New Route PhD is suitable for students working to pursue an academic career, but is aimed primarily at students intending to enter commerce or industry.
- New opportunities have also emerged for part-time students. Most important is the development of professional Doctorates, enabling students to pursue Doctoral studies that is strongly linked with professional development and practice. For example, in the field of Education, the degree of Doctor of Education (EdD) has emerged,

allowing professionals in the area to undertake research relevant to and linked with their workplace. Again, the degree programme, that is commonly more structured than a traditional PhD, may involve taught elements and a combination of research-based project work and a thesis. Another feature of the professional Doctorate is the use of group work to encourage shared learning and to foster peer group support. Similar developments have taken place in Management, with the development of the Doctor of Business Administration (DBA) and are likely to emerge in other professional areas, such as Social Work and Law.

- Doctoral awards can be made on the basis of published work. Although such awards are not new, many universities have increased opportunities for the award of Doctoral degrees on the basis of publications. This possibility is especially the case for academic staff in the “new” universities and for staff in some of the health-related professions.
- Performance-based Doctorates are available. A number of new programmes have emerged, especially in the performing arts, which can lead to the award of a PhD on the basis of creative output, such as music composition, painting, or sculpture, normally accompanied by a critical commentary.

New degree formats often need time before they are fully accepted by students and by employers. This debate is continuing within the United Kingdom. On the one hand, there are those who believe in the pre-eminence of the PhD as a research degree and consider the new formats to be inferior – a less demanding form of study. On the other hand, one can argue that these are simply different routes, meeting the needs of different sorts of students and employers, towards the same end point, the Doctorate. In this context, it is important to stress that the new formats are all strongly research-based and require the assessment of final theses by individually appointed external examiners, in the same way as for a PhD. However, the debate is not helped and is further confused by the existence of certain other Doctoral degree programmes, which are linked to professional training but which do not share these characteristics and which are more appropriately classified as postgraduate taught programmes (for example, the degree of Doctor of Clinical Psychology [D.Clin.Psy]).

In some subject areas, the relationship between undergraduate and Doctoral studies has also changed. Traditionally, most students proceeded directly from an undergraduate (Bachelor’s) degree to Doctoral studies. This route is still the norm in many areas of Science and Engineering. However, in the Arts and Humanities and in the Social Sciences, most students now take a one-year Master’s degree, recognized as providing research training, before embarking on Doctoral studies. In some areas, this degree is referred to as a MRes (Master of Research). The end result is a 1+3 approach to Doctoral studies. Looking to the future, it will be important to see how this structure evolves in the light of the Bologna

Process, with its emphasis on a two-year phase before embarking on Doctoral studies, and the emergence of the European Research and Innovation Area.

Modes of Delivery

In the same way that increasing flexibility has become a feature of funding arrangements and degree formats for Doctoral studies in the United Kingdom, recent years have also witnessed an acceleration in the development of innovative methods of delivery, tailored to meet the needs of Doctoral students and their employers, and increasingly facilitated by the use of modern technology. The 1980s and 1990s witnessed a significant growth in part-time Doctoral studies and the emergence of distance learning methods. No longer were all Doctoral students required to work at set daytime hours. Opportunities emerged to study at home or in the workplace at times convenient to the students themselves. Email now offers the scope for regular and effective contact between Doctoral students and supervisors without the need for face-to-face meetings.

Two inter-related trends are apparent: the development of collaborative programmes and the use of modern information technology, especially web-based systems. Collaboration in the delivery of Doctoral programmes may take various forms. In Scotland, the inter-university Doctoral programme in Economics provides for common first year research training with students moving to particular universities to undertake their specialist research. Another model under discussion involves shared supervision between focal points for Doctoral studies (centers of research excellence) and satellite sites, which may have particular expertise but which may lack the critical mass to provide a full Doctoral experience. Such collaborative arrangements or networks may be subject-based or may be regional in nature. Such collaboration among institutions can now be undertaken relatively easily, based on new methods of communication. Moreover, such collaboration may also be international. Several universities in the United Kingdom are now involved in international partnerships, such as Universitas 21 or Worldwide Universities Network (WUN), which have as a key objective the organization of shared Doctoral programmes, in which students have the opportunity to share programmes, both in a physical sense, by exchanges and visits, but also by the use of electronic media.

New technology, if access to it can be obtained in an affordable way, offers exciting prospects for expanding opportunities to undertake Doctoral studies. At the same time, however, the use of information technology poses a challenge, even a threat, to British universities. First, there is the high cost of investment in new technology and, second, the enormous potential offered by new technology brings with it competitors on an international scale. Potential British Doctoral students might be tempted to study elsewhere and/or British universities could find themselves less attractive to international Doctoral students.

5. QUALITY MATTERS

The 1990s witnessed a growing emphasis on quality assurance within British higher education. Initially, Doctoral studies received less scrutiny from the Funding Councils in their quality assessments and in the methodology applied by the Quality Assurance Agency for Higher Education (QAA). As far as Doctoral programmes were concerned, the lead on quality matters in the early 1990s was taken by the Research Councils (especially by the Economic and Social Research Council (ESRC) and arose from Government concern regarding poor completion rates. Guidance was offered on research training and on good practice, and sanctions were applied against universities and departments with unsatisfactory records for thesis submission.

From the mid-1990s, however, much attention has been devoted to quality matters in the field of Doctoral studies. There are two main areas of concern:

- Definition of a Doctoral award
- Minimum standards for Doctoral programmes

Definition of a Doctoral Award

In 1996, the Harris Report on postgraduate education highlighted confusion relating to the meaning of a wide range of postgraduate awards, at both Master's degree and Doctoral levels. Similar uncertainty existed at undergraduate level following the rapid expansion of new forms of undergraduate provision in the 1980s and 1990s. Against this background, the QAA developed a framework for Higher Education Qualifications in England, Wales, and Northern Ireland, that was given final form in January 2001. This framework aims at

- Enabling employers, schools, parents, prospective students, and others to understand the achievements and attributes represented by the new qualification titles;
- Maintaining international comparability of standards, especially in the European context, to ensure international competitiveness, and to facilitate student and graduate mobility;
- Assisting learners to identify potential progression routes, particularly in the context of lifelong learning;
- Assisting higher education institutions, their examiners, and the Agency reviewers by providing important points of reference for setting and assessing standards.

The framework sets out five levels for qualification: in ascending order, Certificate, Intermediate, Honours, Masters, and Doctoral. The descriptor for qualifications at Doctoral (D) level is as follows:

Doctorates are awarded to students who have demonstrated:

- i. the creation and interpretation of new knowledge, through original research or other advanced scholarship, of a quality to satisfy peer review, extend the forefront of the discipline, and merit publication;
- ii. a systematic acquisition and understanding of a substantial body of knowledge that is at the forefront of an academic discipline or area of professional practice;
- iii. the general ability to conceptualize, design, and implement a project for the generation of new knowledge, applications, or understanding at the forefront of the discipline, and to adjust the project design in the light of unforeseen problems;
- iv. a detailed understanding of applicable techniques for research and advanced academic inquiry.

Typically, holders of the qualification will be able to:

- i. make informed judgements on complex issues in specialist fields, often in the absence of complete data, and be able to communicate their ideas and conclusions clearly and effectively to specialist and non-specialist audiences;
- ii. continue to undertake pure and/or applied research and development at an advanced level, contributing substantially to the development of new techniques, ideas, or approaches,

and will have:

- iii. the qualities and transferable skills necessary for employment requiring the exercise of responsibility and largely autonomous initiative in complex and unpredictable situations, in professional or equivalent environments.

Some points about this description are important. While it does emphasize the creation of new knowledge, it recognizes that such creation may come about through advanced scholarship. Original research is not considered a prerequisite. The framework also formalizes the shift in Doctoral studies towards research training and the acquisition of both specific and generic skills.

Minimum Standards for Doctoral Programmes

Through the 1990s, much attention was centered on the quality and standards of provision for Doctoral students. The impetus for these developments came primarily from concern about completion rates, but it also reflected increasing expectations on the part of Doctoral students themselves and growing competition among institutions. Areas of concern included the more effective specification of research projects linked to the availability of resources and supervision; more formal supervisory arrangements, often involving multiple supervisors, supervisor training and written guidelines and expectations covering student-supervisor contact; clear procedures for student progress, with regular reports and

monitoring, and arrangements for transfer between Master's degree and PhD registration; and a new regulation of assessment procedures, including the appointment of internal and external examiners. As a result, the nature of Doctoral education in the United Kingdom has been transformed. The relaxed informality of Doctoral studies of the 1970s and 1980s has been replaced by a new culture of regulation.

These developments have been mirrored by a new emphasis on the support services and facilities necessary to support Doctoral studies. Most universities in the United Kingdom evolved primarily as undergraduate teaching institutions, but, in many institutions, a new stress is being placed on the needs of Doctoral students. Services, such as libraries and computing facilities, are revising their activities, including extended opening hours for a full calendar year. Accommodation facilities (both study and residential), catering, and transport also need to adapt themselves to meet the needs of Doctoral students.

Many universities reacted very positively to the new emphasis on quality and standards in Doctoral education in the 1990s. However, concerns have continued to be voiced, especially regarding the extent to which Doctoral studies provide broadly based skills training (see, for example, a Government report on "Investing in Innovation", the review of postgraduate programmes by the Arts and Humanities Research Board; a review of career destinations for Arts and Humanities research students, undertaken by the Council of University Deans of Arts and Humanities; and in "*Set for Success*", the review by Sir Gareth Roberts of the supply of people with skills in Science, Technology, Engineering, and Mathematics). A consultation paper (See, Appendices) issued jointly by the Higher Education Funding Councils in May 2003 noted that:

– Chief among these concerns is the perception that United Kingdom research degrees do not prepare people adequately for careers outside academia, either because of insufficient access to transferable skills training, or a more general lack of awareness and articulation among students of the skills gained by studying for a research degree. Alarming, in some disciplines this perception has acted as a deterrent to RDP (research degree programmes) recruitment.

In an attempt to address these issues, and following on from the White Paper for England and Wales, the Funding Councils have issued, for consultation, a set of minimum threshold standards and good practice guidelines for Doctoral degrees. These are reproduced as Appendices. They cover institutional management; the research environment; the selection, admission, enrollment, and induction of students; supervisory arrangements; initial review and subsequent progress; the development of research and other skills; feedback mechanisms; and appeals and complaints.

In practice, these minimum standards and guidelines are a distillation of good practice drawn from universities in the United Kingdom. The

consultation process is ongoing, but to date, the response has been mixed. The need to enhance standards of provision for Doctoral students is not doubted, but there are concerns in some quarters that the proposals represent a further set of requirements for institutions to satisfy and an additional set of bureaucratic hurdles to be overcome. Of concern to some institutions is the implication that these standards and guidelines must be met in order to qualify for block grant funding of Doctoral students through the Funding Councils. In particular, their concern has centered upon the requirement to provide a certain minimum critical mass of active researchers and research students, thereby possibly threatening the position of small research groups or lone researchers or compelling them to interact with larger groups elsewhere.

The precise outcome of this consultation remains to be seen, but what seems to be inevitable is that formal regulation of quality and standards will become further embedded in Doctoral studies in the United Kingdom, and that such provision will be increasingly subject to external audit and assessment. The need to improve quality is not questioned, but the moves to formalize and codify arrangements for Doctoral theses continue to raise debate. In many subject areas, there remains an uneasy tension between the Doctoral thesis as an original piece of research and as research training, and between the inherent uncertainty and unpredictability of research, its progress and its outcomes, and the need for clear procedures and regulation. This debate will, no doubt, continue in the years ahead.

Linked with concerns about the quality of Doctoral studies, the 1990s also witnessed significant organizational changes within institutions relating to postgraduate education. Many universities in the United Kingdom moved to create graduate schools, intended to increase the focus on postgraduate education and to provide additional coordination for both taught courses and research. Such schools could be at department, subject, faculty, or institutional level, and could cover all postgraduates or be restricted to Doctoral students. In many cases, graduate schools have represented a "re-packaging" of activities, both academic and administrative, which would have taken place anyway. Certainly, graduate schools in the United Kingdom have not yet developed to a point at which they resemble the leading Graduate Schools in North America. At the same time, however, it is clear that in some universities, such as Warwick or Nottingham, the creation of a graduate school has marked a major shift in institutional profile. In these cases, the new emphasis on postgraduate, and especially Doctoral activity, is important in establishing the international credibility and standing of such institutions. For other institutions, especially some "new" universities, a graduate school has provided a way to offer a greater critical mass of Doctoral activity.

6. CONCLUSION

This study has attempted to identify some of the key trends in Doctoral education in the United Kingdom and to discuss some of the key issues currently being faced. Continued expansion is surely inevitable. In the past, Doctoral study programmes were viewed primarily as routes into the academic profession. Now, the importance of Doctoral programmes for a wide range of careers and as drivers of innovation and economic development are more widely recognized. With this shift has come a new focus on quality and standards. For the future, a key issue will be one of selectivity and the extent to which Doctoral studies should either be concentrated in a limited number of institutions or be re-structured with clusters of institutions working together in various ways to deliver training and research projects. It will be interesting to see how such issues are resolved, especially the balance between regulation and incentive in promoting new ways of working. Underlying all this debate will be questions relating to the freedom of institutions to offer Doctoral studies and the importance of Doctoral studies in distinguishing a “university” from other organizations of higher and tertiary education. For other institutions, the key issue will be one of size and the ability of universities to compete on the international stage with other leading research-driven institutions, particularly those in the United States) in the delivery of cutting edge research programmes. Against this background, the relative importance of Doctoral education is set to increase, not only in numerical and financial terms, but, especially, with respect to its political profile.

7. APPENDICES

Minimum Threshold Standards and Good Practice Guidelines for RDPs (HEFCE Consultation Paper, May 2003)

Under each heading, proposed minimum threshold standards are in italics; recommended good practice guidelines are in plain text.

1. Institutional arrangements

Evidence that the institution has paid attention to the quality of research training.

- a. *Implementation of a code of practice across the whole institution covering the eight headings in this framework.*¹
- b. Institution to monitor, review, and act on the application of its code of practice.
- c. Institutional and unit performance to be monitored annually on progress against agreed targets, including:
 - i. Submission rates
 - ii. Average time to submission

¹ Alternatively, this might be evidenced through university regulations or similar [provisions].

- iii. Completion rates
- iv. Number of appeals and complaints
- v. Number of appeals and complaints upheld
- vi. Student feedback.

2. Research environment

RDPs should only be offered where the student can be trained in an environment that is supportive of research.

- a. *Unit/cognate area of research to facilitate effective interactions between the student and a mix of active researchers and students.² For units with small numbers of active researchers and students, provision should be made for interaction with related units at the same or other institutions.*
- b. *[Some] 70 percent of submissions made within four years for full-time students, or eight years for part-time students (calculated at institutional level).*
- c. *Adequate facilities for the research project, including library and IT facilities.*

3. [The] selection, admission, enrollment, and induction of students

[The] selection, admission, enrollment, and induction procedures should be clear and consistently applied, in order to promote equality of opportunity and ensure that the student is appropriately prepared for the RDP and fully understands its requirements.

- a. Normal entry requirement to be either:
 - i. *2 degree in a relevant subject (or overseas equivalent)*
 - ii. *Relevant Master's qualification (or overseas equivalent)*
 - iii. *Institutionally defined equivalent accreditation of prior learning (APL) or experiential learning (APEL)*
- b. Selection process and admission decisions to involve at least two demonstrably active researchers trained in selection and admissions procedures.
- c. Open access to all relevant admissions material on the Web.
- d. Formal offer should include:
 - i. Total fees and charges
 - ii. Period of study
 - iii. Specific requirements
 - iv. Other requirements

² An earlier informal consultation proposed a minimum standard for critical mass of at least five research active staff or post-Doctoral researchers and ten research students. Many responses made compelling arguments against this target (mainly on the grounds that it was unrealistic for small and specialized units), and this standard was revised accordingly. However, it is still believed that interaction among research students, post-Doctoral researchers, and research-active staff is a crucial component of high quality RDP provision, and institutions are therefore invited to propose suitable numerical thresholds.

- v. Direction to other relevant information, such as university regulations and codes of practice, preferably on the Web
 - vi. Student's responsibilities
- e. Student and institution to sign... an agreement on the desired outcomes of the RDP (see Section 6a).
 - f. Institution to provide a formal induction process and monitor attendance.

4. Supervisory arrangements

Systematic and transparent supervisory arrangements to be in place to ensure that the student has access to regular supervisory support, input from other research-active staff, and advice from an independent source, and is insulated against the risk of the unplanned loss of a supervisor.

- a. *All new supervisors to undertake mandatory institutionally specified training.*
- b. *Supervision to be provided by a supervisory team, preferably comprising at least two demonstrably active researchers with relevant knowledge and skills, one of whom should be designated as the main supervisor with overall responsibility for the student. Where this is not possible, one supervisor with relevant knowledge and skills is acceptable provided that an independent advisor is appointed to whom the student can refer general academic and pastoral issues.*
- c. *Main supervisor normally to have had experience of at least one successful supervision within a supervisory team (defined as taking a student all the way through to a research degree award). Where the main supervisor has not had such experience, supervision must be provided by a supervisory team comprising at least one demonstrably active researcher with experience of at least two successful supervisions.*
- d. *Main supervisor should normally take prime responsibility for a maximum of six students (head count). Where the main supervisor has responsibility for more than six students, the institution should demonstrate how it guarantees adequate contact between student and supervisor and avoids overburdening supervisors.*
- e. *There should be regular structured interactions between the student and the supervisor or supervisory team to report, discuss, and agree upon academic and personal progress. Outcomes of all such interactions [are to be] recorded.*

5. Initial review and subsequent progress

Systematic and transparent monitoring and assessment mechanisms to be in place to ensure that the student's progress is reviewed independently and [that] the final examination is rigorous, fair, and consistent.

- a. Institutional procedures and time limits to be set, and unit performance monitored, for initial review and subsequent progress covering:

- ii. Supervisory teams, review panels, and examiners.
- iii. External parties, including external examiners, funders, collaborative organizations, employers and alumni.

b. Incorporate this feedback into the regular review of academic standards and provide information on action taken in response.

8. Appeals and complaints

- a. *Institution to arrange and publicize separate, fair, transparent, robust and, consistently applied complaints and appeals procedures, appropriate to all categories of students.*

Annex A

Skills Training Requirements for Research Students: Joint Statement by the Research Councils/AHRB

INTRODUCTION

The Research Councils and the Arts and Humanities Research Board (AHRB) play an important role in setting standards and identifying best practice in research training. This document sets out a joint statement of the skills that Doctoral research students funded by the Research Councils/AHRB would be expected to develop during their research training. These skills may be present on commencement, explicitly taught, or developed during the course of the research. It is expected that different mechanisms will be used to support learning as appropriate, including self-direction, supervisor support and mentoring, departmental support, workshops, conferences, elective training courses, formally assessed courses, and informal opportunities.

The Research Councils and the AHRB would also want to re-emphasize their belief that training in research skills and techniques is the key element in the development of a research student, and that PhD students are expected to make a substantial, original contribution to knowledge in their area, normally leading to published work. The development of wider employment-related skills should not detract from that core objective.

The purpose of this statement is to give a common view of the skills and experience of a typical research student, thereby providing universities with a clear and consistent message aimed at helping them to ensure that all research training is of the highest standard, across all disciplines. It is not the intention of this document to provide assessment criteria for research training.

It is expected that each Council/Board will have additional requirements specific to their field of interest and will continue to have their own measures for the evaluation of research training within institutions.

SUMMARY OF RESEARCH TRAINING REQUIREMENTS

Research skills and techniques – to be able to demonstrate:

- The ability to recognize and validate problems.
- Original, independent, and critical thinking, and the ability to develop theoretical concepts.
- A knowledge of recent advances within one's field and in related areas.
- An understanding of relevant research methodologies and techniques and their appropriate application within one's research field.
- The ability to critically analyze and evaluate one's findings and those of others.
- An ability to summarize, document, report, and reflect on progress.

Research environment – to be able to:

- Show a broad understanding of the context, at the national and international level, in which research takes place.
- Demonstrate awareness of issues relating to the rights of other researchers, of research subjects, and of others who may be affected by the research, e.g., confidentiality, ethical issues, attribution, copyright, malpractice, ownership of data, and the requirements of the Data Protection Act.
- Demonstrate appreciation of standards of good research practice in their institution and/or discipline.
- Understand relevant health and safety issues and demonstrate responsible working practices.
- Understand the processes for funding and evaluation of research.
- Justify the principles and experimental techniques used in one's own research.
- Understand the process of academic or commercial exploitation of research results.

Research management – to be able to:

- Apply effective project management through the setting of research goals, intermediate milestones, and prioritization of activities.
- Design and execute systems for the acquisition and collation of information through the effective use of appropriate resources and equipment.
- Identify and [gain] access [to] appropriate bibliographical resources, archives, and other sources of relevant information.
- Use information technology appropriately for database management, recording, and presenting information.

Personal effectiveness – to be able to:

- Demonstrate a willingness and ability to learn and acquire knowledge.
- Be creative, innovative, and original in one's approach to research.

- Demonstrate flexibility and open-mindedness.
- Demonstrate self-awareness and the ability to identify [one's] own training needs.
- Demonstrate self-discipline, motivation, and thoroughness.
- Recognize boundaries and draw upon/use sources of support as appropriate.
- Show initiative, work independently, and be self-reliant.

Communication skills – to be able to:

- Write clearly and in a style appropriate to purpose, e.g., progress reports, published documents, thesis.
- Construct coherent arguments and articulate ideas clearly to a range of audiences, formally and informally, through a variety of techniques.
- Constructively defend research outcomes at seminars and viva examination.
- Contribute to promoting the public understanding of one's research field.
- Effectively support the learning of others when involved in teaching, mentoring, or demonstrating activities.

Networking and teamworking – to be able to:

- Develop and maintain co-operative networks and working relationships with supervisors, colleagues, and peers within the institution and the wider research community.
- Understand one's behaviours and impact on others when working in and contributing to the success of formal and informal teams.
- Listen, give, and receive feedback and respond perceptively to others.

Career management – to be able to:

- Appreciate the need for and show commitment to continued professional development.
- Take ownership for and manage one's career progression, set realistic and achievable career goals, and identify and develop ways to improve employability.
- Demonstrate an insight into the transferable nature of research skills to other work environments and the range of career opportunities within and outside academia.
- Present one's skills, personal attributes, and experiences through effective CVs, applications, and interviews.

BIBLIOGRAPHICAL REFERENCES

- BOURNER, T., BOWDEN, R., and LAING, S. "Professional Doctorates: The Development of Researching Professionals", in T. BOURNER, T. KATZ, and D. WATSON, eds. *New Directions in Professional Higher Education*. Buckingham: SRHE/Open University Press, 2000.

- BOURNER, T., BOWDEN, R. and LAING, S. "Professional Doctorates in England", *Studies in Higher Education* 26 (2001): 65-83.
- Burgess, R. *Beyond the First Degree*. Buckingham: SRHE/Open University Press, 1997.
- DFES. *The Future of Higher Education*. London: HMSO, 2003.
- HEFCE. *Improving Standards in Postgraduate Research Degree Programmes*. Bristol: HEFCE, 2003.
- HESA. *Students in Higher Education Institutions (1994-95)*. Cheltenham: HESA, 1996.
- HESA. *Students in Higher Education Institutions (2001-02)*. Cheltenham: HESA, 2003.
- QAA. *Framework for Higher Education Qualifications*. Cheltenham: QAA, 2001.
- ROBERTS, G. *Set for Success*. London: HMSO, 2002.
- TAYLOR, J. "Changes in Teaching and Learning in the Period to 2005: The Case of Postgraduate Higher Education in the UK", *Journal of Higher Education Policy and Management*, 24 1 (2002): 53-73.
- UGC. *Statistics of Education, 1972*. Vol. 6. London: HMSO, 1975.

XIII. The United States: Present Realities and Future Trends

PHILIP G. ALTBACH

1. INTRODUCTION

Doctoral studies in the United States form a huge and diverse enterprise.

Seen from the outside, American graduate education is often hailed as the “gold standard” to which other nations and academic institutions aspire. From the inside, however, Doctoral studies face many challenges. Examining the current condition and future prospects of Doctoral studies in the United States may serve a useful purpose as other countries continue to look to American research universities for guidelines as they cope with the expansion of Doctoral studies.

As the European Union prepares to reorganize university degree structures to fit the Bachelor’s-Master’s-Doctoral pattern and to implement the European Credit Transfer System, it makes sense to consider the American system, which has included both of these practices for a century or more. There are several other reasons why it is relevant to examine American Doctoral studies. The United States is the host country for more than 550,000 students, almost half of whom are studying at the graduate level. American Doctoral degree recipients hold key leadership positions around the world, especially in developing countries.

This study will provide some basic information concerning Doctoral studies in the United States and will focus attention on the challenges it is facing. While some American analysts might disagree, the author’s basic perspective is that American graduate education, in general, and Doctoral studies, in particular, are largely successful and effective. The system of Doctoral studies as it has evolved in the United States over the past century and a half serves both the academic system and society reasonably well. Indeed, many of the problems facing Doctoral studies are engendered by the success of the system. Some of the challenges facing Doctoral studies relate to broader societal forces while others are internal to the academic system.

Doctoral studies need to be viewed alongside broader trends in American higher education, and especially graduate education. The Doctorate, especially the PhD, is the pinnacle of a large and complex higher education system. This study focuses mainly on the PhD degree, the research-oriented Doctorate, and not on the increasingly important professional Doctorates such as the Doctor of Business Administration (DBA), the Doctor of Law (JD), the Doctor of Education (EdD), and others, even though some attention will be paid to these degrees. Doctoral study is also related to graduate education, generally Master’s degree programmes in many fields, including the traditional arts and sciences and in numerous professional fields (Conrad et al., 1993). Post-Doctoral study is also not considered in detail in this

discussion; however, in many fields in the Physical and Biomedical Sciences, a post-Doctoral research appointment is increasingly considered part of research training and is quite common.

Doctoral studies cannot be separated from either the American academic research enterprise or the arrangements for teaching large numbers of undergraduates in the larger research-oriented universities (Graham and Diamond, 1995). Doctoral students, especially in the Sciences, are an integral part of the research system. They provide the personnel at relatively low cost, who do much of the research under the supervision of senior professors. The research grants provided by government agencies, such as the National Science Foundation and many others, by private philanthropic foundations, and increasingly, by corporations, are the sources of funding for graduate assistants who work in the area of research while studying for their Doctorates. In many cases, dissertation topics relate to the funded research.

This system of financial support for Doctoral study and basic research works well for American higher education. It ensures financial support for students as well as faculty mentorship and supervision for them, and it ensures a steady source of labour for research projects. These research funds are awarded on a competitive basis, and as a result, the bulk of financial support for Doctoral students in the sciences goes to the prestigious research-oriented universities.

Doctoral students in all disciplines, but especially in the Social Sciences and Humanities, serve as teaching assistants and sometimes as lecturers for undergraduate courses. In return for modest stipends and tuition scholarships, Doctoral students provide much of the teaching in large undergraduate courses. Typically, they work under the supervision of a senior professor and conduct discussion sections for students as well as helping with grading and evaluation. In the Sciences, Doctoral students may help with laboratory supervision. Funds for teaching assistants generally come directly from the university.

The United States spends about half of the world's R&D funds, and a significant amount of R&D expenditure is undertaken by universities. Basic research, especially, is university-based. A significant proportion of applied research, some of it funded by the corporate sector, is also located on university campuses. Thus, the health of Doctoral programmes in universities is of considerable importance for the entire research enterprise in the United States.

2. THE SIZE AND SHAPE OF THE SYSTEM

In terms of total student enrollment, the American system of higher education is the second largest in the world after that of China, enrolling fourteen million students in post-secondary institutions. At the same time, the United States has by far the largest enrollment in graduate and professional studies. While no accurate statistics are available on the numbers of Doctoral students in American universities, it is likely that

around 400,000 students are working at the Doctoral level in all fields.¹ In 2000, 44,808 Doctoral degrees and an additional 80,057 post-baccalaureate professional degrees (e.g., Medicine, Law, Theology, and others) were awarded. It is possible that half of the world's Doctoral students are studying in the United States.

The size, scope, and diversity of Doctoral studies make accurate description difficult. A total of 406 universities award Doctoral degrees, but fifty of them award half of all degrees (Nerad, 2002). The fifty top degree providers consist largely of the most prestigious research-oriented universities, both public and private; however, the proportion of Doctorates granted by these prestigious universities has declined over the years.² People assume that institutions like Harvard and Yale are the largest Doctorate awarding institutions, but in fact, of the top ten providers, eight are public universities (including the University of California at Berkeley and the University of Wisconsin at Madison, which are the top two). The only two private universities in the top ten are Nova Southeastern University (a for-profit institution of questionable quality) and Stanford University.

Like the rest of the American higher education system, Doctorate-granting institutions are highly stratified. While Doctoral studies continue to be dominated by the most prestigious institutions, much of the growth in the past thirty years has been in less prestigious public universities seeking to boost their reputations by offering Doctoral degrees. In the highly competitive American system, offering graduate and professional degrees is interpreted as a sign of prestige and of joining the "big leagues" of research universities. Some public university systems, such as those of California, limit Doctoral degree programmes to specific institutions – for example, only the institutions of the University of California can award Doctoral degrees, while the larger number of schools in the California State University system are limited to Bachelor's and Master's programmes. Universities offering the Doctoral degree are a reflection of the highly differentiated American system of higher education. Many are among the most prestigious institutions, both public and private, in part because research-oriented universities tend to be at the top of the hierarchy, but others are regional universities offering Doctorates in certain fields.

In a small number of cases, specialized institutions offer Doctoral degrees. Rockefeller University, for example, only offers Doctoral degrees in the Biomedical Sciences but is one of the most prestigious institutions of its kind in the world. There are a few freestanding Law and Business schools in this category, as well. A small number of specialized institutions

¹ In 2001, there were 354,800 students enrolled in the Science, Engineering, and Health fields in academic departments offering the Doctoral degree. Some of these numbers are Master's degree students, but most are likely to be studying for the Doctorate.

² The major Doctoral institutions are members of the Association of American Universities (AAU). This organization, established in 1900, is generally viewed as representing the major, research-oriented American and Canadian universities.

are authorized to offer Doctoral degrees in Psychology or Psychotherapy and some other fields. Some well-known universities – the California Institute of Technology, for example – are quite small institutions that concentrate on a small cluster of disciplines. In the past decade, for-profit academic institutions have emerged, and very few of them offer Doctorates. The large majority of Doctoral degrees are, however, offered by traditional universities.

3. PATTERNS OF DOCTORAL STUDIES

The basic structure of Doctoral higher education in the United States has increasingly become the pattern worldwide. Aside from some variations, describing the organization of Doctoral studies in the United States is a fairly simple task. The traditional pattern of American post-secondary education includes three degrees, the four-year Bachelor's degree, a Master's degree, that is typically one to two years in duration, and the Doctorate.³ Doctoral study is quite variable in duration. While new "executive" Doctorates exist in applied fields, such as School Administration, that can be finished in three years, including a dissertation, the "time-to-degree" in the traditional arts and sciences fields has been increasing – to almost nine years in the Humanities and six years in the Life Sciences. In some fields and at some universities, students are admitted to Doctoral study directly after completion of the Bachelor's degree, while in other cases, a Master's degree is required for admission to Doctoral Programmes.

Like much else in American higher education, many variations exist in the structure of academic degrees, along with considerable differentiation and competition among institutions and even among academic departments and programmes. It should be kept in mind that, at the undergraduate level, the majority of American higher education is unselective – community colleges for the most part are "open door" institutions offering entry to anyone with a secondary school qualification. Many four-year colleges and some lower-tier universities admit virtually all students with the appropriate academic qualifications. Doctoral admission is, of course, more selective, even at the less prestigious universities. At the top of the system, admission to Doctoral programmes is immensely selective, with only the top candidates being admitted, while at institutions lower in the hierarchy, standards for admission are less stringent.

Traditionally, the Doctorate was the quintessential research degree, aimed at preparing students for a career in academic research, or, in some fields, applied research. For years, however, many Doctoral recipients, in fact, have done relatively little research in their careers, having been involved mainly in post-secondary teaching. Virtually everyone who holds a regular academic

³ More than 25 percent of American students attend community colleges that offer two-year degrees known as Associate degrees. Study at community colleges may result in a terminal Associate degree, or students may transfer to four-year colleges or universities and complete two additional years for the Bachelor's degree.

appointment in a four-year college or university, and many in the community college sector, hold Doctoral degrees. The growing disjunction between the traditional purpose of the degree – training for research – and the actual use made of the Doctorate has led to some criticism of the pattern of Doctoral studies, but so far, to little actual change.

The organization of Doctoral studies varies by discipline and field and also, to some extent, by institution. However, in all of American higher education, coursework, a set of examinations, and a dissertation are standard requirements for the Doctorate. In contrast to traditional European patterns of Doctoral studies, the American degree relies heavily on formal courses as an integral part of the process. The standard pattern for Doctoral studies includes approximately two years of formal coursework, which may include considerable laboratory work in the Sciences. Courses typically include basic and advanced material relating to the field and the appropriate methodology both for doing research and for preparing a dissertation. Coursework is followed by a comprehensive examination, aimed at ensuring that the student has in-depth knowledge of the field.

These examinations come in many different forms depending on the discipline, department, and university, sometimes including both oral and written parts or only written elements. Some examinations feature extended review essays, while others cover the discipline more directly. If a student fails to pass the examination (several attempts are generally permitted), he or she is dropped from the Doctoral programme. In such cases, which are not uncommon, the student is often awarded a “terminal” Master’s degree. Upon successful completion of the Doctoral qualifying or comprehensive examination, the student then prepares a dissertation proposal and engages in dissertation research. Most universities also stipulate a hearing concerning the dissertation proposal, before it is formally approved, and the student has authorization to proceed with the research.

The dissertation is a central element of any Doctoral programme and is intended to be a significant piece of original research that makes a new contribution to science and the discipline. A significant number of students never complete their dissertations, creating the informal category of ABD (all but the dissertation). The proportion of ABDs varies by institution and discipline, but it is high and growing.

Dissertations vary in terms of rigour and focus, of course, with major variations by discipline. In the hard sciences, dissertation topics are often related to the research programme of the supervising professor, which may involve a team-based project. In the Humanities and the Social Sciences, dissertations are typically individual projects reflecting the interests of the researcher, often with some influence from the faculty supervisor. Dissertation supervision is the main responsibility of the “major professor”, usually with the assistance of several other faculty members. The length, scope, and quality of a Doctoral dissertation vary widely, depending on the discipline, the views of the supervisors, the norms of the university, and, of course, the interests and the ability of the student. The length of time it takes for students to complete dissertations has come under much

criticism, especially in the Humanities and, to some extent, in the Social Sciences as the time-to-degree has increased for Doctoral studies.

The traditional Doctorate in the Arts and Sciences varies in practice from that awarded in various professional fields that offer Doctoral degrees. For example, the Doctorate of Education (EdD), a degree usually obtained by people interested in school administration and related educational professions, requires a dissertation, but one, however, that is more a description of a project than based on original research. Other professional Doctorates have also introduced variations on the research-based dissertation. The growing trend toward tailored professional Doctorates in such fields as Management Studies, Education, etc. means that accredited Doctoral degrees are now offered that include cohort-based weekend course work and dissertations or other research projects that many would say fall considerably short of traditional Doctoral requirements. While many people have criticized this trend as “cheapening” the traditional Doctoral degree, such programmes are growing in numbers, as are Doctoral degrees offered by for-profit academic institutions, usually in professional fields, that always lack the rigour of a traditional Doctoral degree.

Another aspect of the system of Doctoral studies is post-Doctoral study. In some fields in the sciences, the “postdoc” is becoming a standard part of the Doctoral study cycle. A significant number of Doctoral degree recipients take post-Doctoral positions immediately following completion of their degree studies, spending a year or more affiliated to a laboratory prior to competing on the job market. Post-Doctoral study permits a scientist to work closely with a senior researcher and often with a research group. In some fields, a post-Doctoral experience is a necessary prerequisite to obtaining a regular academic position. This arrangement delays the start of a career in some ways and introduces an additional level of uncertainty. Post-Doctoral appointments are largely limited to the Sciences. They are seldom available in the Humanities or the Social Sciences.

4. ACCREDITATION AND QUALITY CONTROL

Doctoral study takes place, in the United States, mainly at traditional universities – academic institutions that offer undergraduate and graduate degrees, including the Doctorate, in a variety of disciplines and fields. These institutions are accredited by one of the regional accrediting agencies responsible for accrediting all post-secondary institutions in the United States. These regional agencies are not government bodies, but rather private organizations, controlled by the academic community itself and recognized by government to carry out accrediting activities. Non-accredited institutions are typically not eligible to receive government loans or to grant funds. In some fields of study – such as Engineering, Business Administration, Law, and Teacher Education, among others – additional accrediting bodies controlled by the professional associations must provide authorization for institutions to offer degrees of various kinds. The traditional Arts and Sciences disciplines have no accrediting beyond the

overall institutional accreditation described above. This patchwork of accreditation and authorization, carried out by non-governmental organizations and agencies, but with government at both state and federal levels recognizing the validity of these accreditors, constitutes the pattern of American accreditation.

Institutional and programme accreditation has a long history and is, in general, quite rigorous. Institutions are asked to provide detailed information and self-evaluations of their work, encompassing Doctoral programmes, extracurricular activities, academic resources, such as libraries and laboratories, the qualifications of academic staff, and many other aspects. This information is carefully evaluated by accreditation teams made up of peer committees, and final decisions are made by the accrediting bodies. Institutions and programmes are given basic accreditation. They are not ranked in any way. When a university or a programme specialty is found deficient in some way, it can be given provisional accreditation and asked to remedy the problem or, in rare cases, it can be denied accreditation. A denial generally means that the institution or programme ceases to function.

In some states, additional authorization from state agencies is required in order to offer specific academic degrees, with some states extending this authority to private as well as to public institutions. This authorization is often legally required in order for academic institutions to operate, and can apply both to entire colleges or universities or to specific degree programmes. In some cases, state authorization is linked to institutional or programme quality, but more often it is a matter of appropriately registering with state agencies and providing evidence of adequate academic resources – such as libraries, teaching staff, and the like. Some states also take into account the perceived need for additional programmes or institutions in the state. It is universally the case that there are controls over establishing or expanding public institutions or programmes. Controls over private institutions vary from state to state. The processes involved are less rigorous than accreditation. Accreditation basically provides certification that an institution or programme meets the minimum standards of academic quality and has the minimum resources deemed necessary.

Accreditation is not the same thing as quality control or assessment. In fact, there is no systematic quality control over higher education institutions or academic programmes at the national level in the United States. In a few states, there are some limited, and generally incomplete, efforts to measure the academic quality of public institutions and their academic programmes. While there is considerable discussion concerning the quality of academic programmes and concern over the costs of providing academic degrees, no comprehensive plans exist to measure quality in any systematic way. One specific issue being discussed widely is the perceived need to measure the outcomes of academic programmes in addition to the inputs, but there are no agreed-upon standards or programmes relating to such measures.

No national or state quality assessment of Doctoral programmes in any discipline takes place. However, several agencies have attempted to rank academic institutions and discipline-based programmes. The most influential and widely circulated of such rankings is that undertaken by U.S. News and World Report, a weekly general interest magazine. The U.S. News annual rankings attempt to measure quality, based on a number of variables for academic institutions and programmes at all levels. Rankings are provided for graduate programmes in many, but not all, academic and professional fields, but there are no specific rankings for Doctoral programmes alone. The most comprehensive national evaluation of Doctoral programmes was carried out by the Committee for the Study of Research-Doctorate Programmes in the United States and was conducted by the National Research Council (Goldberger et al., 1995). This study ranked Doctoral programmes in various academic fields, but not in professional areas. Professional organizations, including some that accredit graduate programmes, have been concerned with quality assessment and assurance, as well. For the past thirty years, the Carnegie Foundation for the Advancement of Teaching has provided a categorization of American academic institutions by type – including a category for research and Doctoral universities. While not a ranking, this listing helps to identify types of institutions.

The basic fact, however, is that the United State has a complex and highly effective set of accrediting arrangements, sponsored and managed by the academic community, that provides a basic “floor” concerning academic quality and resources at all levels of the post-secondary system, but very little in terms of quality assurance or assessment. Indeed, the United States is behind some other countries in thinking about and implementing programmes in this area.

5. THE FUNDING OF DOCTORAL STUDIES

The pattern of funding for Doctoral studies in the United States is complex. As with higher education generally, funding comes from a combination of sources. For Doctoral studies, sources include the fifty state governments (mainly through the funding of public higher education institutions and systems), the Federal government (mainly through research grants to individual professors and occasionally to academic institutions and several different kinds of loan programmes), tuition and other fees paid by students, university endowments, philanthropic foundations, and businesses of various kinds. The mix of funding varies by field, type of institution, and even programme within a university. Generalization is difficult.

Basic institutional support is provided for public universities by the states; however, the proportion of state funding has decreased in many states as part of a public disinvestment in higher education generally and in the light of current economic difficulties. The Federal government traditionally does not provide basic institutional funding, even though it does support some university-based laboratories and facilities in areas designated as being in the national interest – mainly, although not exclusively, defense-related.

Neither State nor Federal funding is available for basic institutional support for private universities, even though a few states do provide direct funding to private universities for Doctoral studies and the Federal government funds some research facilities at private institutions. For private institutions, basic funding comes from tuition and other fees, the endowments of given universities, and other funds, research grants, and contracts.

The mix of funding also varies by institution. The top fifty Doctoral granting universities receive the bulk of their research funding from the federal government. They also dominate foundation and corporate research funding. These universities are typically able to provide funding packages for many, and in some cases, virtually all of their Doctoral students. A large proportion of students have research assistantships and work directly on research projects with professors. This pattern holds for both public and private universities. Less prestigious universities have fewer financial resources. More of their students pay for their studies, and a larger proportion serve as teaching assistants than is the case at top-tier schools.

There are also differences by field and discipline. The Sciences are generally better funded than the Humanities and the Social Sciences. A larger proportion of Doctoral students in the Sciences receive funding packages that permit them to study on a full-time basis. The sizes of stipends and scholarships are also typically larger. There is less external funding available in the Humanities and the Social Sciences. As a result, fewer students receive full financial support. Most students study part-time. A larger proportion obtains loans rather than grants; more take longer to complete their Doctorates, and more drop out before completing their degrees.

In the United States, the provision of funding for Doctoral study is a perennial difficulty. The present situation is especially problematical, because of a change in funding patterns in most states and the impact of the economic downturn. State governments, in general, have reduced their overall support to public higher education. This reduction has had an influence on Doctoral studies because the decline in general support has meant fewer resources, higher tuition charges, and less funding for academic facilities. At the same time, corporate R&D expenditures in certain fields have declined. The Federal government has, so far, not significantly reduced funding for research, but the focus of research funding has shifted to some extent. More importantly, the Federal student loan programmes have not kept pace either with demand or with the rising tuition charges at many universities. Funding for Doctoral studies faces some difficult challenges.

6. DOCTORAL STUDIES AS AN INTERNATIONAL ENTERPRISE

International students constitute an important element of Doctoral studies in the United States. Almost half (238,497) of all international students are studying at the graduate level, with a majority of these in Doctoral programmes. International students constitute 13 percent of all graduate

students, significantly higher than the 2.7 percent of all undergraduate students that are international students. Just as important, international students tend to be concentrated at the most prestigious universities and in a small number of fields of study. Business and Management is the most popular field for international students (almost 20 percent of enrollments are international students), followed by Engineering and Mathematics, and Computer Science. In these fields, about half of all Doctorates are earned by international students. It is also the case that international students from a number of the countries sending the largest numbers to the United States – such as India, China, South Korea, and several others – tend not to return to their home countries immediately following the completion of their degrees – with half or more remaining in the United States.⁴

In fields such as Engineering, Computer Science, Mathematics, Business Administration, and several others, a significant proportion of the teaching staff is also from countries other than the United States. International students are especially numerous in Doctoral programmes at the most prestigious research-oriented universities. Many international students who earn Doctorates in the United States do not return to their countries of origin, and significant numbers embark on academic careers (Choi, 1995).⁵ Those who do return home bring the norms and orientations of their American Doctoral training with them.

The model of American Doctoral studies – *i.e.*, the commitment to teaching and research at the same institutions, rather than separating the two activities into specialized research institutions and teaching-oriented universities; coursework as part of Doctoral studies; a variety of academic institutions of varying quality, prestige, and orientations offering Doctoral degrees, and a mixture of funding patterns – has proved to be quite influential globally. While American universities have not exported Doctoral training abroad, as they have done with some undergraduate and especially professional degrees, other countries have looked to the United States as a model for expanding Doctoral training. For example, Japan is currently expanding its Doctoral training opportunities and is looking mainly to the United States for ideas.

Although the United States borrowed the basic concept of Doctoral studies from Germany in the Nineteenth Century, adapting it to meet American conditions, the United States, in recent years, has not been much influenced by other countries. The influence flows largely from the United States to the rest of the world.

⁴ Most of these statistics are from Koh (2002).

⁵ In many fields, foreigners with American Doctorates find it easier to enter the academic profession than to compete for jobs in business or other sectors of the American economy. Americans, on the other hand, are often attracted to private sector employment in which remuneration is higher than in academe. As a result, foreign degree holders are probably disproportionately represented in academe.

7. CHALLENGES TO DOCTORAL STUDIES

Seen from abroad, American Doctoral studies seem successful and innovative. Unparalleled in size, comprehensiveness, and quality, Doctoral studies in the United States seem to have little about which to worry. True, there are major criticisms made of Doctoral studies, and the entire system of Doctoral studies and research faces some difficult challenges in the coming decade.

The following discussion highlights some of the main points of criticism currently being discussed in the United States.⁶

The Research Enterprise and Doctoral Studies

Doctoral studies are closely linked to the research enterprise in American higher education, especially to basic research. In the Sciences, the traditional model of research production is under strain. There is greater pressure for research to be linked to applied usage, especially so that income from patents and other innovations can be earned (Bok, 2003). There is also pressure from private-sector corporations, especially in fields such as Biotechnology, to be involved in academic research and to have rights to the results of research done on campus. Traditional funders of basic research, including such government agencies as the National Science Foundation, as well as private philanthropic foundations, have been critical of the traditional patterns of research funding. At present, the level of funding for research has not significantly decreased; however, there is some evidence that patterns of funding may be changing. Moreover, funders are, in many cases, less willing to provide money for Doctoral students, especially when such support cannot be directly justified in terms of research outcomes.

Doctoral studies, especially in the Sciences and at the most prestigious research-oriented universities, are linked to trends in research funding – both amounts of money available for research and the configuration of research support. This linking introduces significant uncertainty in terms of levels of funding that will be available, the areas that will receive external support, and the numbers of students who can be supported.

The tight link between external research funding and Doctoral studies in the sciences at the most prestigious universities has always been problematical. So long as funds were available and providers permitted the academic institutions sufficient autonomy, the system worked. Now, there are signs that this *status quo* is changing, and it is not clear how either basic research or the provision of funds for Doctoral students will survive. This situation has never been a major factor in the Social Sciences or especially in the Humanities, since significant research funding has not, in any case, been available.

⁶ This discussion follows many of the points made by Maresi Nerad in her paper “The Ph.D. in the US: Criticisms, Facts, and Remedies” (2002).

The Narrowness and Limited Relevance of Doctoral Training

As knowledge has expanded, there has been a trend toward increased specialization in Doctoral training, producing Doctoral-degree holders whose skills are limited and who, as a result, have limited opportunities for employment (National Academy of Sciences, 1995). Employers in industry and many students and recent graduates complain that their training was too narrow and that graduates were ill-prepared for a rapidly changing job market. The Doctoral *curriculum* and the philosophy of Doctoral studies are mainly in the hands of professors who are, in general, insulated from the job market.

A related complaint, perhaps most widespread in the Humanities and Social Sciences, is that Doctoral-degree holders are not well trained to teach. This complaint is related to the narrowness of the *curriculum*, but it also highlights the fact that Doctoral programmes provide virtually no training in pedagogy and many offer only limited, if any, opportunities to teach.⁷ It has been pointed out that the majority of Doctoral degree recipients in the Humanities and Social Sciences, and a large proportion of the total numbers, engage primarily in teaching at the post-secondary level, including in community colleges. Critics have advocated that Doctoral preparation must include training to teach. They point out that even those Doctoral students who serve as teaching or laboratory assistants during their degree programmes are often not given instruction in how to perform their limited teaching duties. While pedagogical training has never been part of Doctoral studies in the United States, many advocate it as a necessary reform to meet the changing roles of Doctoral degree holders in many fields.

Doctoral training, many critics argue, has also become ever more specialized, creating further problems for degree holders as they enter an increasingly differentiated and complex job market. The reasons for increased specialization relate to the expansion of scientific knowledge in all fields and the perceived need to discover new knowledge, albeit in an ever contracting universe. Doctoral faculty, committed to the traditional values of scholarship in this context, have contributed to this specialization. Critics have also argued that Doctoral training is inappropriate for contemporary science and scholarship. It does not sufficiently emphasize collaborative work and new trends in scientific investigation. These trends have played themselves out in different ways in various disciplines, with more of them affected than others, and with variations by broad scientific field as well.

Growing Irrelevance in a Changing Job Market

Owing, in part, to the overspecialization discussed here, to a changing academic labour market, and to the fact that growing numbers of

⁷ The Carnegie Foundation for the Advancement of Teaching is currently studying Doctoral preparation in the United States and will focus on teaching as an essential part of the process.

Doctoral-degree holders are finding employment outside the universities, there has been criticism that the Doctorate has become irrelevant (Altbach, 1999). Faculty members responsible for Doctoral training still have the traditional model of a faculty career in mind. The fact is that even for those entering the academic profession, the terms and conditions of the professoriate have changed for many. A declining proportion of Doctoral-degree holders can expect to work at research-oriented universities, while a growing number find themselves at colleges and universities that focus on teaching rather than on research. And in many fields, only a minority, and sometimes a small minority, find positions in academe. The job market for Doctorate holders has been ever more diverse as many enter private industry, including entirely new fields such as biotechnology, consulting firms, and the like. Government service at various levels also increasingly attracts Doctoral graduates.

This changing and in many ways expanding job market for PhD holders has put pressure on Doctoral training to be more flexible and aimed at a wider array of careers than the traditional academic profession. While some fields have made some minor changes, there has been little rethinking of the links between Doctoral training and the changing labour market. The Center for Innovation and Research in Graduate Education has done research to show that both the career goals of Doctoral students and the actual jobs obtained by graduates are changing.⁸ In Biochemistry, for example, only 32 percent of Doctoral students intend to follow a teaching, while in Electrical Engineering, 35 percent aspire to the professoriate. In English, 81 percent desire, an academic career, as do 72 percent in Political Science. In terms of actual employment, the "PhD's-Ten Years Later" study found that about two-thirds of Doctorates in English, Mathematics, and Political Science held professorial positions, while half of those in Biochemistry and roughly one-third of those in Computer Science and Electrical Engineering were in the professorate (Nerad, 2002, p. 7). A significant and growing number of PhD. recipients are employed outside academe.

The transition from Doctoral study to work is also increasingly problematical in the United States. Obtaining an academic job, still a goal for many Doctoral students and the predominant desire in many fields, is difficult and ever more complex. It is taking longer for a PhD holder to secure a tenure-track academic position. The growth of post-Doctoral studies/training in the Sciences lengthens the time period for obtaining a "regular" academic position in those disciplines. And there is little articulation between Doctoral study and the growing number of non-academic jobs available to PhD holders. Efforts are being made to smooth this degree-to-work transition, but the problems are considerable.

⁸ The Center for Innovation and Research in Graduate Education is a new agency involved in research analysis relating to graduate study. Further information can be obtained from CIRGE, Box 353600, University of Washington, Seattle, Washington 98195, USA. E-mail: cirge@u.washington.edu

"Time-to-Degree" and Degree Completion

Many observers have noted that obtaining the Doctoral degree is taking longer on average, a situation viewed as a problem. It now takes between six and nine years to complete a Doctorate — with variations by field and by institution. Students in the Humanities take the longest, while those in the Life Sciences complete their studies most rapidly. There are many reasons for this trend. Faculty members point out that knowledge has expanded and that it takes more time to impart the necessary skills (including ever more complex methodologies) to Doctoral students. As funding has become less available for the growing number of Doctoral students, many are forced to study part-time or to delay their studies. In the Humanities, where funding is most problematical, students often accrue loan obligations of \$20,000 to \$30,000 during their Doctoral studies. Further, the changes in patterns of funding tend to slow Doctoral completion as students are asked to serve as teaching or research assistants, often in areas peripherally related to their specialties.

Some have pointed out that the increased time-to-degree is not cost effective either for students or for academic institutions. The universities accrue costs from having students remain on campus for an extended period, and of course, the students themselves face low incomes and the continuing expenses of study. Increased time-to-degree lowers morale and contributes to a growing rate of non-completion of studies. This complex nexus of conditions has created a pattern that has made Doctoral study increasingly difficult.

Recruiting the Best and the Brightest

One of the greatest challenges for American higher education in the coming period will be that of recruiting top-quality scholars and scientists to staff the post-secondary education system and especially to ensure that the research universities have the best-quality staff. Doctoral studies play a key role in this arena, because the academic profession as well as those who staff research laboratories and institutions of all kinds typically hold Doctorates and are trained at research universities that offer Doctoral degrees. Those at the top of the system are trained in the key twenty or thirty American research universities.

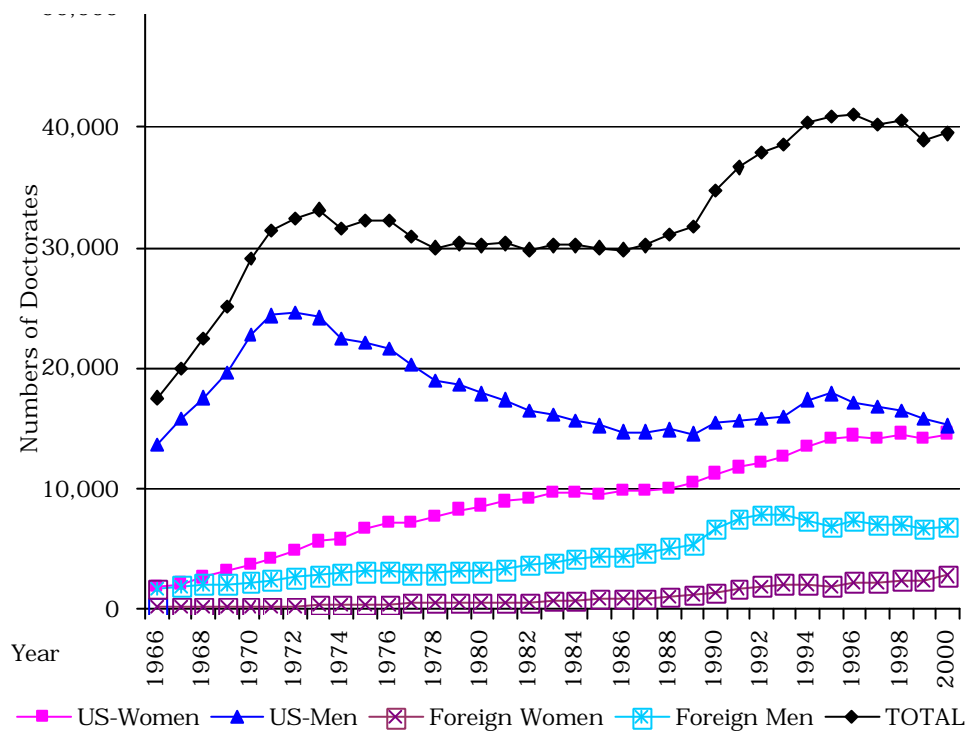
Ensuring future scientific and academic leadership is now in question. The problems facing Doctoral studies in particular and higher education in general in the United States, some of which are discussed here, are serious. Continuing financial problems are placing strains on the Doctoral training system and on higher education. Universities find it difficult to compete with the private sector for the best talent. Many of the best young minds are unwilling to undergo the long, poorly paid, and often disorganized road to a Doctoral degree. The problems encountered by PhDs in obtaining academic employment are another deterrent.

The United States imports some of the best minds from other countries. In some cases, these people are trained at American universities, and

many seek employment in American academe. Others are recruited from universities overseas, lured by better salaries and working conditions in the United States. This strategy is neither fair to other countries, nor is it an assured means of providing the best talent.

8. QUANTITATIVE DATA⁹

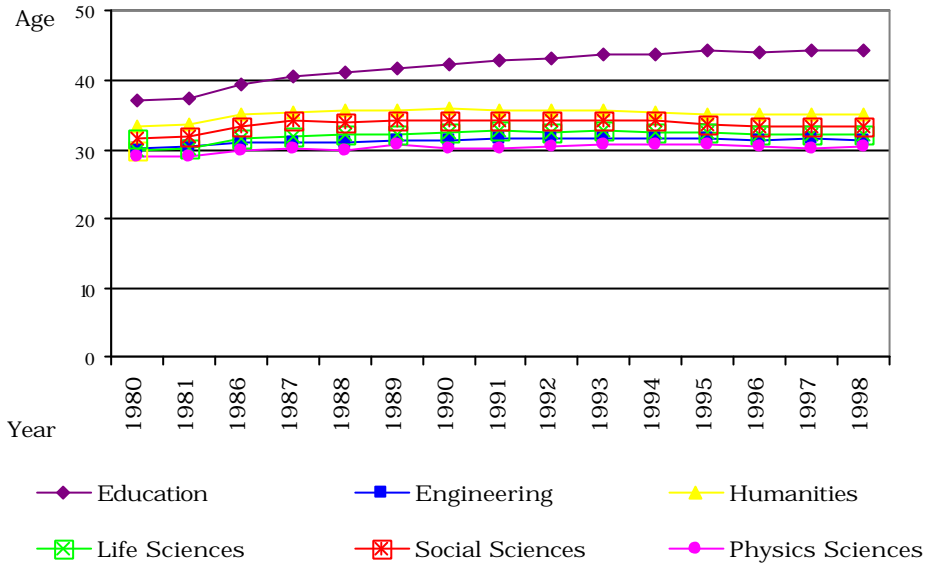
Figure 1. Awarded Doctorates in the United States by sex (1988-2000)



Source: CIRGE, UW Seattle, *Digest of Educational Statistics*, 2001.

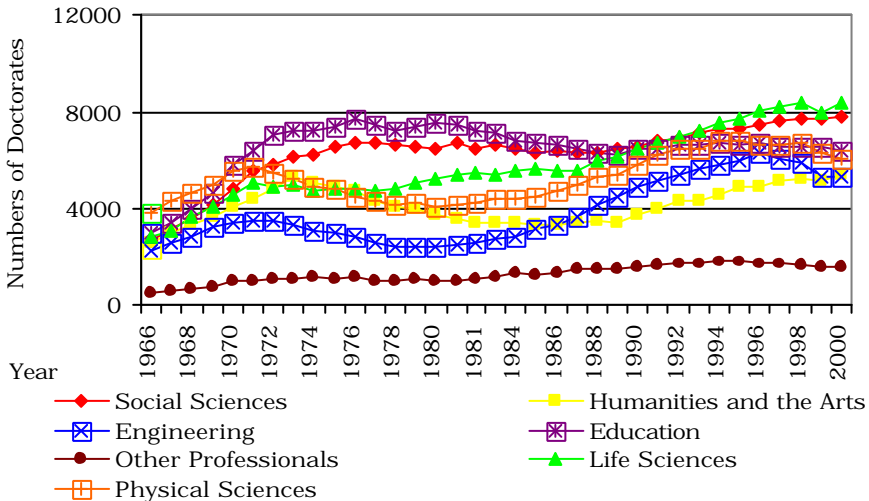
⁹ The four figures and one table appearing below were produced by Dr. Ta. Liu, a post-Doctoral fellow at the Center for Innovation and Research in Graduate Education (CIRGE) at the University of Washington in Seattle, USA. They were part of a presentation on the statistics of Doctoral studies in the United States made by Dr. Maresi Nerad, Director of CIRGE, at the UNESCO-CEPES "International Seminar on Doctoral degrees and Qualifications in the Contexts of the European Higher Education Area and the European Research and Innovation Area" (12-14 September 2003). They have been inserted into this study by the UNESCO-CEPES editorial staff with the approval of its author and of Dr. Nerad.

Figure 2. Median age by major field at the award of a Doctorate (1980-1998)



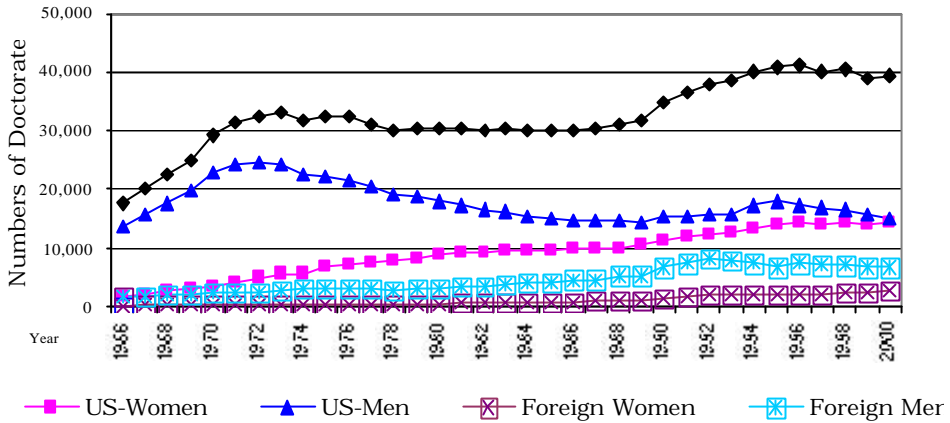
Source: CIRGE, UW Seattle, NSF Web CASPAR, Doctoral Record File, 2001.

Figure 3. Percent of Doctorates by major field of study awarded in the United States to non-US citizens (1986-2000)



Source: CIRGE, UW Seattle, Digest of Educational Statistics, 2001.

Figure 4. US Doctoral Degrees by major field of study (1966-2000)



Source: CIRGE, UW Seattle, NSF Web CASPAR, *Doctoral Record File*, 2001.

Table 1. Award of American Doctorates by type of institution in 2000 (in numbers)

Institution type	Institutions	PhDs	Total PhDs %
All Doctorates	406	41,368	100
Research I	89	27,168	66
American Association of Universities	61	21,748	53
Largest 50 institutions	N/A	21,228	51
Largest 25 institutions	N/A	13,351	32
Largest 10 institutions	N/A	6,442	15

Source: CIRGE, University of Washington, September 2003.

9. CONCLUSION

This analysis has provided both an overview of the pattern of American Doctoral study and an indication of some of the problems facing this key sector of higher education. It may seem paradoxical that the American system of Doctoral studies, that is admired and often replicated in other countries, is seen by many people in the United States as having some severe problems. The basic structure of Doctoral training in the United States, as it evolved during the past century, is an effective means of training creative specialists in the disciplines and, increasingly, in multidisciplinary fields. Doctoral programmes have proved to be sufficiently flexible to allow for new scientific developments and to adjust to the development of mass higher education.

The American pattern of combining instruction and research as part of Doctoral preparation has proved to be effective. The “taught Doctorate”, as opposed to the European-style research Doctorate, has been effective in providing the depth of knowledge required by the expanding disciplines.

Locating Doctoral study in universities rather than in specialized research-focused institutions has also been effective. The fact that Doctoral studies exist in a large and highly differentiated academic system is also a major advantage, particularly in that Doctoral studies are, for the most part, located at the best universities, institutions that can, in general, afford to provide the facilities needed for quality instruction and research.

The basic structure of American Doctoral studies does not seem to be in need of dramatic change. However, reforms that will ensure that past successes can be continued are needed. Of greatest importance, perhaps, is ensuring that sufficient funds are made available to provide high-quality training and to support the research enterprise that is integrally related to Doctoral studies. It is also necessary to ensure that Doctoral programmes are sensitive to changing employment trends, scientific developments, and the needs of Doctoral students and faculty.

BIBLIOGRAPHY

References

- ALTBACH, P. G. "Harsh Realities: The Professoriate Faces a New Century", in P. G. ALTBACH, R. O. BERDAHL, and P. J. GUMPORT, eds. *American Higher Education in the 21st Century: Social, Political, and Economic Challenges*. Baltimore: Johns Hopkins University Press, 1999.
- BOK, D. *Universities in the Marketplace: The Commercialization of Higher Education*. Princeton: Princeton University Press, 2003.
- CHOI, H. *An International Scientific Community: Asian Scholars in the United States*. Westport, Connecticut: Praeger, 1995.
- CONRAD, C. F., HAWORTH, J. G., and MILLAR, S. B. *A Silent Success: Master's Education in the United States*. Baltimore: Johns Hopkins University Press, 1993.
- GOLDBERGER, M. L., MAHER, B. A., and FLATTAU, P. E., eds. *Research-Doctoral Programs in the United States: Continuity and Change*. Washington, D.C.: National Academy Press, 1995.
- GRAHAM, H. D., and DIAMOND, N. *The Rise of American Research Universities: Elites and Challenges in the Postwar Era*. Baltimore: Johns Hopkins University Press, 1995.
- KOH, H.-K. *Open Doors: Report on International Educational Exchange*. New York: Institute of International Education, 2002.
- NATIONAL ACADEMY OF SCIENCES. *Reshaping the Graduate Education of Scientists and Engineers*. Washington, D.C.: National Academy Press, 1995.
- NERAD, M. "The Ph.D. in the US: Criticisms, Facts, and Remedies", Paper prepared for a conference at the Center for Higher Education Policy Studies, Enschede, University of Twente, The Netherlands, 2002 (unpublished).

Other Literature

- ALTBACH, P. G. "The American Academic Model in Comparative Perspective", in, P. G. ALTBACH, P. J. GUMPORT, and D. B. JOHNSTONE, eds. *In Defense of American Higher Education*. Baltimore: Johns Hopkins University Press, 2001, pp. 11-37.
- CLARK, B. R., ed. *The Research Foundations of Graduate Education: Germany, Britain, France, the United States, Japan*. Berkeley: University of California Press, 1993.
- CLARK, B. R. *Places of Inquiry: Research and Advanced Education in Modern Universities*. Berkeley: University of California Press, 1995.
- GEIGER, R. L. *To Advance Knowledge: The Growth of American Research Universities, 1900-1940*. New York: Oxford University Press, 1986.
- GEIGER, R. L. *Research and Relevant Knowledge: American Research Universities since World War II*. New York: Oxford University Press, 1993.
- GUMPORT, P. J. "Graduate Education and Organized Research in the United States", in, B. R. CLARK, ed. *The Research Foundations of Graduate Education*. Berkeley: University of California Press, 1993, pp. 225-260.
- RHOADES, G. "Graduate Education", in, Philip G. ALTBACH, ed. *International Higher Education: An Encyclopedia*. New York: Garland, 1991, pp. 127-146.

XIV. Developing Doctoral Degrees and Qualifications in Europe: Good Practice and Issues of Concern – A Comparative Analysis

BARBARA M. KEHM

1. INTRODUCTION

This analysis is based on the thirteen country studies on the Doctorate, which are published in this volume. The countries involved in this study on the evolution of Doctoral education are Austria, France, Germany, Italy, the Netherlands, Norway, Poland, Romania, the Russian Federation, Spain, Sweden, the United Kingdom, and the United States of America.

In all of these countries, Doctoral education or training is an issue of concern and scrutiny. In many of them, reforms were introduced recently or are being currently introduced. The reasons vary somewhat; however, a number of issues come up in all or most of them. There are frequent references to the European Higher Education Area and to the European Research and Innovation Area, on the one hand, and to the role of universities and Doctoral education, respectively, in the knowledge society, on the other hand. These references remain rather vague and tend to serve as metaphors of legitimization for national concerns. Still, the issues are very similar.

The following analysis consists of four parts. First, there is a recapitulation of the requirements for the creation of a European Higher Education Area and a European Research and Innovation Area, as they have been formulated and discussed in the policy arena. Second, a list of ten issues is identified, around which current debates on the reform of Doctoral education are focused. Third, a number of concerns and the problems encountered in reforming Doctoral education are identified. In the fourth part, the role of the Bologna Process and the plans to create a European Higher Education, Research, and Innovation Area are discussed with respect to the challenges these attempts pose for the reform of Doctoral education.

2. REQUIREMENTS OF THE EUROPEAN HIGHER EDUCATION AREA (EHEA) AND THE EUROPEAN RESEARCH AND INNOVATION AREA (ERIA)

Already, during the first half of the 1990s, Antonio Ruberti, the European Commissioner for Research from 1993 to 1994, had developed a vision for a European area of research in which Doctoral education was meant to play an important role. At an international seminar held at the University of Twente in the Netherlands, Ruberti presented a paper in which he stated that “as regards the creation of a common European space for science and technology, a strategically important role, and in some

respects, a decisive role, is played by the acquisition of a 'European dimension' in research training – that is Doctorates.¹ Ruberti's idea was not only to create a European support programme for mobility and exchange of Doctoral students but was also aimed at achieving a convergence in the financial support offered to them. Ruberti assumed a continuous diversity in Doctoral studies but wanted to improve the quality of training and the usefulness of the Doctoral degree for the professional labour market. In his short term of office, he did not manage to create such a programme for mobility and the exchange of Doctoral students; however, the issue was currently taken up again in the discussions to create a European area for research and innovation. Doctoral studies in Europe were discussed at the Bologna stocktaking conference that took place, in Berlin, in October 2003.

Doctoral studies were also an issue in a number of background papers, declarations, and communications, which were published in the context of the Conferences of Ministers responsible for Higher Education, held in Bologna in 1999 and in Prague in 2001, but the matter only became an official item on the agenda in Berlin in 2003.² The initiative of the Ministers at first purposely excluded representatives of the European Commission, but the European Commission supported the initiative of the Ministers by complementing the agenda for the creation of a European Higher Education Area with the initiative to create a European Area of Research and Innovation.³ In March 2000, the European Council held a special meeting in Lisbon to "agree [on] a new strategic goal for the Union in order to strengthen employment, economic reform, and social cohesion as part of a knowledge-based economy".

The Presidential conclusions defined a strategic goal for the next decade, "to become the most competitive and dynamic knowledge-based economy in the world, capable of sustainable economic growth with more and better jobs and a greater social cohesion".⁴

At the intersection of both these initiatives lies the issue of Doctoral education and research training. Not only will universities have an important role to play in achieving the goal of becoming the most

¹ Ruberti Antonio. "The Role and Position of Research and Doctoral Training in the European Union". Manuscript of a presentation given at the University of Twente on 7 April 1997.

² "The European Higher Education Area." Joint Declaration of the European Ministers of Education convened in Bologna on the 19th of June 1999. "Towards a European Higher Education Area." Communiqué of the meeting of European Ministers in charge of higher education in Prague on 19th of May 2001. "Realising the European Higher Education Area." Communiqué of the Conference of Ministers responsible for Higher Education in Berlin on 19 September 2003.

³ Communication from the Commission to the Council, the European Parliament, the Economic and Social Committee, and the Committee of Regions: "Towards a European Research Area." COM (2000) 6, Brussels, 18 January 2000.

⁴ Presidency Conclusions. Lisbon European Council. 23 and 24 March 2000. <http://www.europarl.eu.int/summits/lis1_en.htm> accessed on 22 November 2003.

competitive and knowledge-based economy in the world, but they also are the most important institutions in which Doctoral studies take place.

The communication of the European Commission of February 2003 about the Role of the Universities in a Europe of Knowledge [COM(2003)58 final] is considered to be one of the most important policy papers with regard to the topic at hand. The document not only acknowledges the importance of higher education institutions in the creation of a Europe of knowledge, but it also identifies a number of factors still preventing higher education institutions from fulfilling this role in an adequate way.

For the purposes of this analysis, a short overview of the document is given. It opens by identifying five basic challenges with which universities are currently confronted:

- dealing with increased demand for higher education in the face of reduced resources (staff and funding);
- dealing with increased competition, not only from outside Europe but also within Europe;
- increasing and strengthening co-operation with enterprises and businesses and contributing more effectively to technological innovation;
- finding a new balance between basic or pure and applied research;
- providing better access for atypical groups of students and including more persons from outside universities in their governing boards.

One characteristic that can be observed, when reading the case studies (country reports), is a lack of balance regarding the issue of co-operation *versus* competition. On the one hand, the creation of a European Higher Education, Research, and Innovation Area is aimed at creating more unity and transparency within this space to enhance mutual trust and co-operation while becoming a stronger competitive force on the global scale. On the other hand, issues of “brain drain” and “brain gain”, as well as the generating of income through the provision of Doctoral education continue to be underlying but important issues creating competition within the European Higher Education, Research, and Innovation Area.

Interestingly, this issue is also taken up in the document produced by the Commission and discussed in terms of the tension between the continuing national base and structure of higher education in the face of an increasing European dimension. From this tension, three more challenges have arisen:

- the need to further improve recognition so that a European labour market can be established;
- the need to improve competitiveness on a global scale so that Europe can become increasingly attractive for students and researchers;
- the need to deal with the expected increase in heterogeneity of the European higher education landscape owing to the enlargement of the European Union.

After having identified these challenges, the document formulates three goals and proposes a number of measures as to how to achieve them, asking the Member States and other interested stakeholders to discuss them and to come up with additional and/or different proposals for achieving the goals. The three goals are the following:

- i.* to secure sufficient funding and to utilize available resources more efficiently;
- ii.* to strengthen excellence and performance;
- iii.* to open up to the environment and to the world outside as well as to secure increased international/global attractiveness.

The measures and requirements proposed to achieve these goals are held together by the one overarching and extremely ambitious aim formulated at the meeting of the European Council in Lisbon in 2000: "To make Europe the most competitive and most dynamic knowledge-based economy in the world [by] the year 2010." In this economy, the European systems of education are supposed to become a "worldwide reference for quality".

This document is not only one which – finally (if one can say that) – acknowledges the important role of the universities, and certainly other higher education institutions, for social, cultural, and economic development at a national and a global level, it is also a document which leaves no doubt that the education and training of a highly qualified workforce, including the teaching and research staffs of the higher education institutions themselves, is an issue on the forefront of concern if these goals are to be achieved.

In July 2003, the European Commission's communication about the role of universities in a Europe of knowledge was complemented by another communication to the Council and the European Parliament on "Researchers in the European Research Area: One Profession, Multiple Careers."⁵ This communication notes the continuing diversity and variety of research training and conditions of Doctoral education and identifies a tendency towards deregulation in the academic career system. It also calls for "making the training of researchers of greater relevance for a wider variety of careers than in the past" and enumerates a number of consequences for Doctoral programmes which should:

- enhance the employability of researchers by including in the training both core skills and wider employment related skills;
- review the structure of training for researchers and to integrate Doctoral programmes into the Bologna Process;
- develop more organized training within the framework of Doctoral programmes;
- pay attention to the quality of supervision and provide access to a supervisor at all levels of the training;

⁵ COM (2003) 436 final. Brussels, 18 July 2003

- integrate Doctoral students into a research environment but also highlight alternative careers and provide Doctoral students with as many contacts as possible;
- assure the financial situation and the social security rights of Doctoral students;
- analyze the status of Doctoral students and provide a better overview of the characteristics of Doctoral education and research training opportunities in Europe.

The aim of this synthesis report as well as the country case studies is to contribute to the tasks listed above.

3. ISSUES

Institutional Structures and the Shape of Doctoral Education

The trend in most of the countries represented in this volume is to establish a relatively formal structure for Doctoral education, *i.e.*, abolishing the traditional “apprenticeship model”, consisting of a professorial supervisor and independent research, in favour of more structured research education and training within disciplinary or interdisciplinary programmes or graduate schools.

The programmes that have been created or are currently under discussion are intended to reduce the duration of Doctoral education, to reduce dropout rates, and to provide more targeted research training. Typically, they include course work plus a plan for undertaking supervised research for a thesis. Often, both systems of Doctoral education still exist in parallel (*e.g.*, in Germany, Austria, Russia, Poland, Italy, and Norway). While the traditional apprenticeship model relies on a personal relationship between the Doctoral student and the supervisor, the structured programme model has a more regulated and standardized approach.

As many of the countries included in this analysis are currently re-designing their degree structures as well, the shape of a Doctoral programme is also dependent, to some extent, on whether the new Master’s degrees already include or will include a research option, which may represent the taught part of Doctoral studies (or some part of them). This option is being debated in France and Spain. Its aim is to reduce the length of Doctoral training.

Some country studies (Sweden, Spain, and the United States) report two phases in their Doctoral education, the first phase consisting mostly of coursework and concluding with a candidate degree or a certificate in advanced studies, while the second phase consists more or less of research and the writing of a thesis.

A number of countries included in this analysis have detailed regulations concerning the institutions that are authorized to offer Doctoral education or to set up graduate schools and the requirements

that institutions and Doctoral candidates must meet in order to embark on Doctoral education. Such regulations are most developed in the Russian Federation, Sweden, Norway, and the United Kingdom, but for different reasons in each country. Only a few countries, in particular the Netherlands, Norway, and Sweden, but also Italy, have some kind of contractual relationship between the Doctoral student and the institution, regulating the rights and obligations on both sides. As a rule, institutions offering Doctoral education and awarding Doctoral degrees must either be accredited by the State to do so or be a certain type of institution (i.e., a university). In most countries, private institutions and the non-university sector institutions cannot award Doctoral degrees. Again, in most countries, selected extra-university research institutes and/or academies of science have been granted either the right to confer Doctoral degrees or the right to train Doctoral students in co-operation with a university that then confers the degree. In several countries (e.g., the Netherlands, Spain, and Sweden), higher education institutions not having university status can co-operate with universities in the framework of graduate schools or, as is the case for Sweden and Norway, may even award Doctoral degrees in specified subjects. Only in the Russian Federation are Doctoral degrees awarded by a governmental body rather than by the institutions. In Romania, Doctoral degrees have to be validated by a national body.

Several countries included in this study report an emerging distinction between research Doctorates and professional Doctorates (the United Kingdom, Austria, and the United States of America). This distinction also shapes some elements of the programmes for Doctoral studies. There is still a problem of definition and distinction in most countries in terms of Doctoral education *versus* research training. Closely related to this issue is the status of Doctoral candidates who range from fully salaried employees, via a hybrid status in-between, that of an employee and a student, to that of a grant-holder and a fee paying student (see below for more details on this question).

The American pattern of BA/MA/PhD tends to be considered as “the gold standard” to which European universities aspire or should aspire. However, even if the pattern of BA/MA/PhD and a structure of coursework followed by more or less independent research is eventually adopted all over Europe, requirements, contents, and regulations will vary.

Admission to Doctoral Studies

Admission procedures range from being highly regulated and highly competitive to being rather informal and unregulated. The apprenticeship model is very informal and unregulated – i.e., a student does not have to do any course work and can choose his or her own thesis topic but has to find a professor who accepts the task of supervision and the chosen topic. The programme model, on the other hand, tends to be highly regulated and contractual in a variety of aspects. Some countries included in this study admit only a fixed number of Doctoral candidates, a situation that

makes admission highly selective, for there are usually more applicants than openings. Such a situation characterizes Italy, Sweden, Romania, and the United Kingdom. The reasons for restricting the numbers of Doctoral candidates are typically the requirement to guarantee adequate resources and to support, as in the case of Italy, the numbers of available tenured positions for post-Doctoral academic staff. The Swedish report indicates that a sharp decline in the numbers of applications occurred, when admissions to Doctoral programmes were restricted in 1998. The reason was that admission became dependent on available funding for the entire postgraduate period that the university had to guarantee. In disciplines with less access to external funding (e.g., the Humanities and the Social Sciences), this stipulation led to a considerable decrease in the numbers of postgraduate students.

As a rule, all Doctoral programmes have admission procedures. Entrance examinations, however, are required in the Russian Federation, Italy, and Romania. Sweden, Norway, and the Netherlands have introduced or are currently introducing official admissions procedures, i.e., rules for application, eligibility, selection, and decision about candidates applying for participation in a Doctoral programme. In the United Kingdom, a code of ethics and minimum threshold standards, including good practice guidelines for Doctoral programmes, have been introduced, which also regulate the selection, admission, enrollment, and induction of Doctoral students.

It is also noteworthy that admission to Doctoral programmes or acceptance as a Doctoral student is possible in some countries without having earned a previous degree. Other countries require at least a Bachelor's degree (or the equivalent), and again, others, a Master's degree (or the equivalent). If one considers that, by far, not all countries included in this analysis have established the pattern of 3+2+3, denoting the number of years to earn, respectively, a Bachelor's, a Master's, and a Doctoral degree, which has been proposed in the framework of the debates on the creation of a European Higher Education and Research Area, the requirements for access to Doctoral studies in terms of number of years of previous study and previous formal qualifications vary considerably. In addition, efforts are underway in a few countries to open access to Doctoral programmes for professionals with practical experience (see below for additional details in regard to the issue), so that diversification in terms of access and admission requirements will continue to increase.

Status of Doctoral Students and Requirements

In most of the countries under consideration in this volume, the status of a Doctoral student is that of a student being enrolled at a university and affiliated to a department, a research institute, a research team, or a laboratory in his or her field of specialization. In addition, a Doctoral student might also be a member of a graduate school or participate in a

cross-disciplinary Doctoral programme. Such schools and programmes frequently charge tuition fees. There are, however, several exceptions.

In Poland, many Doctoral students have the status of junior scholars through employment in their universities as teaching assistants. This status provides them with faculty privileges but no regular salaries. Currently, a new draft law envisages giving Doctoral candidates a student status rather than continuing their status as faculty members. In France, Doctoral students enter into a contractual relationship with their university, by signing a "Thesis Charter", which defines the responsibilities on both sides. Doctoral students have student status and must be enrolled so that they can be eligible for social security benefits. In the Netherlands, a new system of Doctoral training was introduced in 1986 giving Doctoral students the status of Doctoral trainees being employed and salaried by the university on a temporary basis. Training and supervision fees are deducted from the salary. Dutch Doctoral students also have a contractual relationship with their university establishing a plan for training and supervision. The Dutch report actually characterizes the status of Doctoral students as a hybrid, being neither one of full salary, nor one of full student status. This situation has led to an emerging shift away from research training towards Doctoral education but within a framework of regular employment. Romania as well has a somewhat hybrid position for Doctoral students, who can hold a teaching or laboratory position for up to half of the regular workload of a university assistant. Sweden and Norway are probably the most advanced of all countries included in this study concerning the contractual relationship. They require the guaranteed funding of Doctoral students during their entire period of Doctoral study. Usually, Doctoral students are appointed to a postgraduate studentship, which includes course work as well as certain teaching or research obligations which may not exceed 20 or 25 percent of a regular workload. They work on the basis of general and of individual study plans that are approved by a faculty board. Annual follow-up of the plan is part of the individual agreement.

The Funding of Doctoral Studies

The funding of Doctoral studies is another issue of great diversity. In some countries, Doctoral programmes require the payment of tuition fees; others offer stipends to their Doctoral candidates. Frequently Doctoral students are offered positions as paid teaching or research assistants. Such positions constitute an additional workload and usually lengthen the time-to-degree. Many countries provide a range of state grants or scholarships that usually have no social security benefits included. In many of the countries under consideration here, there is also a possibility for part-time Doctoral studies so that funding can be secured through an outside job or a university job. The tendency of the financial situation of Doctoral students to be insecure has led to a number of concerns in terms of status, time-to-degree, and dropout rates. Several countries have tried to

remedy this situation by establishing rules and regulations for Doctoral training and supervision, restricting Doctoral training and education to certain institutional frameworks and availability of resources, and by entering into a contractual relationship which defines the rights and obligations of both sides.

Increasing Numbers of Doctoral Students

Most countries included in this study have experienced an increase in the numbers of Doctoral students over the last ten years or more. In Spain, the numbers of students enrolled in Doctoral studies as well as the numbers of students awarded a Doctoral degree doubled between 1990 and 2000. Numbers in Sweden increased by 35 percent during the 1990s and then stagnated between 1998 and 2000. A similar development is noted in Austria: a tenfold increase in the numbers of Doctoral students between 1980 and 2000 and then a sharp decline reducing the numbers to the level of 1990, owing to new state regulations. Between 5 and 9 or 10 percent of all students having successfully completed their undergraduate studies go into Doctoral training (the United Kingdom, 5 percent; Italy, 6 percent; Germany, 8.9 percent; the Netherlands, 9 percent). An exception in this respect is Spain, where 30 percent of all graduates go into Doctoral studies.

In the majority of the countries under investigation, Medicine and the Sciences continue to have the highest numbers of Doctoral candidates. However, the increases over the last decade have often been due to an increase in the proportion of women going into Doctoral training – e.g., in Italy, 53.1 percent of the Doctoral students during the 1999-2000 academic year, were represented by women; in Spain, the percentage of Doctoral students who are women is currently 51 percent; in France, in 1998, 40 percent of Doctorates were awarded to women. Also, increases in enrollment can be attributed to increases in the proportion of part-time Doctoral students and to a higher number of persons returning to universities for Doctoral studies after a period of employment.

If one looks at subject distribution, the picture is more varied. In some countries, the increases in the numbers of Doctoral students have been in the Humanities and the Social Sciences as well as in what have been called “professional subjects”, e.g., Management and Education, while in other countries, these fields have experienced a decline in favour of the Natural and the Medical Sciences.

Most countries also report an increase in the numbers of foreign Doctoral students. France, for example, awarded 25 percent of its Doctorates to foreign students in 1998. In Germany, in 2000, the proportion was 7.5 percent. The United Kingdom boasts a proportion of 44 percent international students in Doctoral education, 13 percent of whom comes from the European Union member-states and 31 percent from other countries.

The Duration of Doctoral Programmes, Time-to-Degree, and Dropout Rates

The majority of the countries included in this study have certain stipulations in terms of the duration of Doctoral programmes. As a rule, duration is between two and four years. However, in recent years, many reforms and further regulations have been introduced because of concerns about the actual time-to-degree and high dropout rates. Still, in many countries, the average age at the award of the Doctoral degree has been increasing, or, despite a variety of measures, has not been sufficiently reduced. The mean age at the time of the defense of the thesis varies according to subject, but certain country reports included in this study give an overall indication. In Germany, the mean age at thesis defense was 31.9 years in 1990. In 1995, it was 32.0 years, and in 2000 it was 32.7 years. In Norway and Sweden, the mean age at thesis defense was even higher (around 37.7 in Norway in 1995 and 37.9 in Sweden, in the same year) and has not been much reduced in recent years (37.4 years in Norway in 2000 and 37.2 years in Sweden in 2001). The reasons are basically insecure funding and the need to earn money, lack of supervision, additional research and teaching duties, and, last but not least, the insufficient structuring of Doctoral programmes. As this latter problem is not characteristic of Sweden and Norway, one must assume that Doctoral education generally starts at a later age in these countries than in other countries.

Those countries having two phases of Doctoral training – be it two degree levels or course work followed by the writing of a thesis – tend to complain about the fact that the second phase is often not completed. “ABD” – “all but the dissertation” is the American expression designating this situation. The Netherlands has introduced a type of honorary title (*Doctorandus*) denoting the fact that a person has completed part of a Doctoral programme at one stage in his or her life. A few countries (e.g., Spain, Sweden, and the Russian Federation) have an intermediary degree (Diploma of Advanced Studies, Licentiate, and Candidate) indicating that a part of Doctoral training has been completed. Those country reports that included some figures on this aspect mentioned between three and up to five or six years on average for writing the thesis after having completed the first part, *i.e.*, either a degree or required coursework. Even in the United States, coursework takes two years on average, but completion of the degree takes between six and nine years with high dropout rates.

Countries having introduced relatively structured programmes for Doctoral education, including an official part-time status, and have regulations and opportunities for obtaining funding, are usually more successful in reducing duration and preventing dropout. Typically, dropout rates are higher in the Humanities and in the Social Sciences than they are in the Natural Sciences and in Engineering. Most country reports have not included statistics on dropout rates, some of them indicating that no statistics are available. In France, for example, dropout rates vary on average between 12 percent in Science subjects and 51 percent in the

Humanities and in the Social Sciences. The Netherlands has a dropout rate of about 8 percent, and the dropout rate in the Russian Federation is estimated at about 10 percent.

Supervision and Quality Control

Most country reports noted that the long duration required for the completion of a Doctoral degree is assumed to be directly related to a lack of proper supervision and insufficient quality assurance mechanisms. Austria, in particular, pointed out that “overcrowding” in some undergraduate programmes (e.g., a staff-student-ratio of 1:355 at the Institute for Political Science of the University of Vienna) seriously threatens the quality of Doctoral education owing to a lack of supervision. But even in those countries that have a more structured Doctoral education in a framework of proper programmes or graduate schools, insufficient supervision has been a continuous concern. Only four country reports mention regular, *i.e.*, at least annual, follow-ups of agreed study and supervision plans (the Netherlands, Sweden, Norway, and the Russian Federation). However, only those countries providing a contractual relationship between the institution and the Doctoral candidate or a code of ethics, which includes the rights and obligations of both sides and have some kind of appeal mechanism (the United Kingdom, the Netherlands, and Sweden), seem to be able to achieve better results in terms of time-to-degree and the reduction of dropout.

Quality assurance mechanisms for Doctoral studies seem to be most pronounced and highly regulated in the United Kingdom. The establishment of these mechanisms was due to concern about poor completion rates. As of January 2001, the British Quality Assurance Agency for Higher Education (QAA) established a framework for all degrees, including the Doctorate, which defines the required skills and competencies which must be demonstrated in order to be awarded the respective degree. It has also put a new emphasis on minimum standards, facilities, and support structures that must be in place before an institution is granted the right to award a Doctoral degree.

In Sweden, postgraduate education is evaluated every six years by the National Agency for Higher Education (NAHE). In the Netherlands, the research schools are subject to quality assessment as well. However, there is an additional financial incentive as universities are allocated extra funding for each Doctorate that is awarded. In Spain, Doctoral programmes are evaluated annually by a University Commission. In addition, external evaluation of Doctoral programmes is required to obtain state funding. In France, postgraduate or Doctoral schools are only recognized for four years, which is the length of the contract between the individual institution and the State. After four years, an evaluation takes place and – depending on the outcome – the contract can be renewed or not. Italy has only recently introduced certain quality mechanisms for Doctoral education, and Germany and Austria are still rather dependent

on the traditional model of individual acceptance of a Doctoral candidate and his or her topic by a professor who agrees to supervise the research and the thesis.

The Central and East European countries included in this study (Poland, Romania, and Russia) tend to rely on state regulations and governmental bodies. In Romania and the Russian Federation, in particular, over-regulation seems to be the rule, including extensive accreditation and validation measures as well as process control. In Romania, all Doctoral degrees have to be validated by a National Council. In the Russian Federation, all procedures of accreditation, licensing, and certification are carried out by Federal bodies.

Despite the fact that all countries have either *ex ante* or *ex post* quality assurance mechanisms in place, there is great variation and no optimal model can be identified as yet.

Mobility and International Exchange

Only a minority of the case studies gives information about issues of mobility and the international exchange of Doctoral students. In fact, several studies have pointed to low mobility rates. Central and Eastern European countries continue to suffer from brain drain, even though they often want to give their students opportunities to study or do research abroad. The Netherlands and the United Kingdom report that there is scouting for talent and guarding it, often trying to provide a variety of incentives for Doctoral students, from within as well as from outside their countries, to complete a whole programme at one university. This effort is related to funding and income generation on the part of the institutions as well as competition for best talent. The American case study notes that almost half of all American Doctorates in Engineering, Mathematics, and Computer Sciences are awarded to international students, many of whom intend to remain in the United States. The Netherlands, as well, reports that in some technical sciences up to 50 percent of Doctoral students come from abroad, in particular from Asia and Eastern Europe. In the United Kingdom, the proportion of British Doctoral students has fallen from 64 percent, in 1994-1995, to 56 percent, in 2001-2002. Accordingly, the proportion of Doctoral students from other European Union countries ranges between 8 and 13 percent, depending on the field of study and the proportion of other international students in Doctoral programmes ranges from 28 to 31 percent. The proportion of foreign Doctoral students in Spain is also quite considerable, with 16 percent in 2000. The percentage of Doctoral degrees awarded to foreigners in Germany was about 7.5 percent in 2000. In addition, 26 (9 percent) of the 286 graduate colleges funded for Doctoral students by the German Research Association in 2001 were international ones.

All countries have mechanisms in place to receive Doctoral students from abroad and to recognize their previous qualifications. In most countries, with the exception of Spain, the thesis may be submitted in a

language other than the host country language (basically French, English, or German). However, Spain has joint Doctoral programmes with institutions abroad that include periods of study and research abroad and the award of a double degree or a joint degree.

In general, exchanges of Doctoral students for a limited period of study or training abroad tend to be more problematic in Engineering and in the Natural Sciences, as Doctoral students in these fields are more often integrated into groups of researchers engaged in applied research or working on a topic with a competitive aspect. As European patenting and intellectual property rights are not, as yet, wholly regulated, certain research groups feel that they might lose their competitive edge if they send their Doctoral students abroad.

Award of Titles and Degrees

The main task in earning a Doctoral degree is writing the thesis or dissertation and defending it publicly before a commission. The procedure is the same in all the countries under review. Other aspects of the process of earning a Doctoral degree vary to a considerable extent. A number of countries require successfully completed course work as part of earning the degree. Some countries require additional written or oral examinations. Finally, many rules and regulations can be found that deal with the composition of the commission as well as the process of the thesis defense. As a rule, the Doctoral degree continues to be considered as a degree qualifying its holder to undertake independent research. Accordingly, the thesis must consist of a piece of original research on a chosen and approved topic in a particular field or discipline. However, the traditional perception of the Doctoral thesis as a "masterpiece" is changing in some countries to a perception of writing an "apprenticeship piece", thus embodying the idea that the completion of a phase of research training should not be considered equal to the work of a researcher with many years of experience.

The Russian Federation probably has the most complex set of regulations concerning the Doctoral thesis. It consists, altogether, of four steps. The first is a preliminary defense of the thesis in the responsible department. The department evaluates and recommends the work for the final defense. The candidate then submits his or her dissertation to the University Dissertation Council. The Dissertation Council again undertakes a preliminary evaluation and assigns a so-called "leading organization", *i.e.*, a second university, to referee the thesis as well as two opponents for the defense. The final defense of the thesis is carried out before a public audience and consists of a debate between the candidate and the members of the Dissertation Council and the opponents. This event is followed by a secret ballot on the success or the failure of the candidate. In case of success, the dissertation and all supporting documents are submitted to the Higher Certification Commission of the Ministry. This Commission will evaluate all documents, and after final

consideration, award the degree. As the author of the Russian country report has pointed out, it is unusual that the outcome of a defense be achieved by a secret ballot rather than by open acknowledgement that a candidate has or has not demonstrated sufficient research capabilities.

Many countries (Poland, Romania, Spain, and Sweden) include external examiners in the process of conducting a thesis defense. These can be from another university within the same country but also from foreign universities. In all countries included in this study, there is a trend to include more examiners or referees from abroad, or alternatively, to cooperate with overseas universities in Doctoral programmes, including the award of a joint degree. This indicates a move towards increased international co-operation and validation of Doctoral degrees.

With the exception of Germany, Austria, and the United States, most other countries included in this study have implemented regulations to make certain that the examinations and the defense of the thesis are refereed by panels or examination boards that have no direct or personal relationship with the respective Doctoral candidate. Typically, the supervisor of the thesis evaluates the work before it is officially submitted, but after that stage, the supervisor has little or no influence on the process and the decision to award the degree.

Despite attempts to de-personalize the process of earning a Doctoral degree by setting up Doctoral programmes and colleges, Germany and Austria still follow the tradition that a Doctoral student chooses his or her supervisor, who has often been the main examiner for the candidate's first degree. This supervisor also acts as the main referee of the Doctoral thesis, selects a second referee, and is the main examiner in the oral defense of the thesis. This configuration can become very personal and be shaped by dependency of the candidate on the supervisor. However, it is also possible for the Doctoral candidate to change his or her supervisor.

Professional Doctorates as a New Trend

Several countries included in this study (the United States, the Netherlands, the United Kingdom, and Austria) have begun to introduce what is being called a "professional Doctorate", which is distinct from the traditional research-oriented Doctorate. Professional Doctorates (e.g., in Management Studies, Education, Applied Sciences, Public Services) tend to be somewhat less demanding as regards the requirement to produce an "original piece of research". They are often related to projects carried out within an enterprise and jointly supervised by the home university and the respective enterprise, and the course work emphasizes more generic skills and interdisciplinary approaches. The inception of such professional Doctorates is closely linked to a growing concern about the employability of Doctoral-degree holders in the labour market outside academe.

A number of countries, for example Poland, Italy, and Spain, reported that the employment of Doctoral-degree holders outside research institutes and academe is still atypical. Employers in most countries continue to fear

that Doctoral-degree holders are too narrowly specialized and lack generic and transferable skills. The new development of professional Doctorates is intended to remedy this situation by paying more attention to the issue of the employability of Doctoral students outside academe. In several fields of study and scholarship (e.g., Medicine and Chemistry), this approach is not new and has been in effect for quite some time, but there are new aspects to this issue. In the Netherlands, the United Kingdom, and also in the United States, the emerging knowledge economy more and more frequently requires a workforce having research skills. In the United Kingdom, this development is debated in terms of constructing a "professional Doctorate" (e.g., in fields such as Economics and Business Studies or in Education). The United States offers professional Doctorates, which are somewhat less demanding than research Doctorates as regards the dissertation.

First ideas in the development of professional Doctorates include the definition of standards, quality, and skills and entail more regulation in terms of necessary support structures and supervision. In the Netherlands, growing attention is being paid to the employability of Doctoral-degree holders outside academe as well. The first pilot projects are on their way to achieving stronger co-operation with industry and business (e.g., through project work in industry or joint supervision of research) and to establishing research schools in applied sciences (e.g., in Chemistry, Physics, Biology, and Public Services). It is as yet unclear whether or not this development will eventually lead to a training status or to an employment status for the Doctoral students concerned. Overall, the numbers of programmes for professional Doctorates are growing.

Transition to an Academic Career

Basically, most Doctoral degrees continue to be considered as research degrees preparing for a career in universities or research institutes. Poland, Italy, and Spain stated that this characteristic still very much predominates in their respective countries, and that employers outside academe are not very interested in hiring Doctoral-degree holders. But there are exceptions to this rule. In Germany and Austria, there have always been possibilities for Doctoral-degree holders to find appropriate employment outside academe without there being a pronounced distinction between research Doctorates and professional Doctorates.

The example of Chemistry in Germany might illustrate this situation. A Doctorate in Chemistry is almost always required to find employment in this field. A similar case is Medicine. Most medical students earn a Doctorate because it belongs to the prestige and social status of this professional group. In Germany and Austria, quite a few teachers at upper secondary schools that prepare students for access to higher education also have Doctoral degrees.

A contrasting example is Italy, where the numbers of Doctoral students are limited in relation to the available positions within universities and research institutes. However, in most other countries included in this

study, the numbers of Doctoral students have increased over the last ten to fifteen years, and in some countries, efforts to raise their numbers still continue. In several countries, the numbers of staff positions in research and academe have not increased to such an extent that all Doctoral-degree holders will immediately find employment. Therefore, post-Doctoral fellowships provide a possibility, to those awarded Doctoral degrees, to extend their periods of transition to an academic career. As the transition period has become markedly more difficult and/or prolonged in several of the countries under review, the post-Doctoral period has become an issue of concern and scrutiny. The "overproduction" of holders of Doctoral degrees has basically led to various types of post-Doctoral fellowships, which can be characterized as "holding positions" until proper employment is found. But this possibility also prolongs the time until the beginning of a career and introduces an additional layer of uncertainty. Seen from a perspective of return on investment and productivity, this situation is not very viable economically.

4. CONCERNS, PROBLEMS, REFORMS

In trying to summarize a large variety of problems and concerns currently voiced in connection with Doctoral studies, there are two main issues that are noted in the majority of the country reports. The first issue can be summarized under the heading of "time-to-degree". It is composed of questions like quality and structure of programme, supervision, funding, and additional duties. The second issue can be summarized under the heading of "transition to employment". It includes aspects of acquisition of generic skills, utilization of qualifications on the labour market, career prospects inside and outside academe, and research *versus* the professional orientation of Doctoral studies.

The country reports discuss a number of concerns related to these two issues and show that each country varies slightly in terms of where the emphasis is placed. For each of the two main issues indicated above, a few examples will be given.

Concern over "Time-to-Degree"

No country report fails to express some concern over the duration of study and research leading to the successful completion of a Doctorate. Many reports noted that the duration of Doctoral studies has been increasing over the last decade or more and consequently the average age upon completion of the degree. The report about Doctoral education in the United States cites six to nine years, on average, until completion and high dropout rates. In other countries, the duration is often four to six years. In Germany, the duration of Doctoral studies varies, and students are between 31.8 years old in Mathematics and Sciences and 36.5 years old in the Arts, upon completion and award of the Doctoral degree. In France, more than half of the Doctoral students in the Humanities drop out. The reasons associated

with this group of problems are numerous and need, eventually, to be addressed individually. Here, they are enumerated as follows:

- insufficient supervision, lack of time on the part of supervisors, no regulations and standards in place for proper supervision;
- insecure funding of Doctoral students so that they have to engage in outside employment; sometimes, no official part-time status in place; Doctoral students on contract with the respective university department are often overburdened with teaching or research assistance, not all of which is related to their own research; the use by universities of Doctoral students as cheap resources;
- lack of quality and structure of Doctoral programmes; in the absence of graduate schools, often personal and rather informal relationships with the supervisor and hardly any attachment to the university; separation of course work and thesis research, with the latter being independent and insufficiently structured or supervised work; in many countries, no proper and clear regulations or standards in place concerning the definition of what constitutes a successful and acceptable thesis (“original research”, research-based problem solving); often no regular follow-up on the progress of Doctoral students.

These problems are not new. Rather, they have come to the forefront in recent years. In many countries, the solution to the problem was deemed to be the establishment of graduate colleges or schools or at least proper programmes for Doctoral studies, so as to provide better supervision and more structure. Often scholarships or stipends are provided. However, owing to funding constraints, scholarships and stipends have been reduced, and more and more frequently fees are being introduced for Doctoral students. Regardless of whether or not a country has defined an official status as part-time Doctoral student or not, one must assume that a growing proportion of Doctoral candidates today are actually studying or undergoing training part-time, while working part-time or even full-time.

But, it is necessary to focus the problem on one of the core aspects that will have to be discussed at European level: that of funding linked to status. Are Doctoral candidates fee-paying students who provide an important part of the income of an institution but can also demand a certain amount of services and support for their money, or are Doctoral students junior research and teaching staff who are fundamentally involved in the research output and teaching provision of their institutions and should therefore be paid for their contributions?

The Problem of Transition to Regular Employment

The second issue that has come up in a number of country reports is the question of the kind of career and work for which Doctoral candidates should be trained. Here, there is a geographical split. The Central and East European countries as well as the South European countries are experiencing a continuous lack of interest on the part of employers outside academe in hiring Doctoral-degree holders. If in these countries – as is the

case, for example, in Italy, Poland, and Romania – the academic labour market is either closed or unattractive as a means of transition to work for Doctoral-degree holders, the latter face a serious problem. But also in Germany and Austria, Doctoral-degree holders in some subjects (mostly the Humanities and the Social Sciences) experience difficulties leading to the proverbial taxicab driver with a Doctoral degree. From a certain perspective, this situation would be considered a waste of resources and of one's life, because income and rates of return are what count. Other views, based on longitudinal studies of graduate careers, have come to the conclusion that high qualifications are never a waste and eventually lead to jobs in which these qualifications can be utilized, even if transition periods tend to become longer. Only Sweden reports a continuously favourable labour market for Doctoral-degree holders.

But, returning to the country reports, many of them have pointed out a growing disjunction between the traditional purpose and the actual use of the Doctorate. This situation tends to be linked to a growing concern about the high level of specialization and the limited number of skills of Doctoral-degree holders. Doctoral studies are considered to be too narrow or even increasingly irrelevant for a rapidly changing job market. With limited and/or unattractive employment opportunities in academe in some countries, Doctoral students are forced to seek employment outside higher education institutions without having appropriate training. In addition, an uncertain future also affects the quality of candidates who are taking up Doctoral studies. Two solutions to this problem have been mentioned in the country reports: the concentration of Doctoral training in centers of excellence and/or the introduction of professional Doctorates oriented to careers outside academe. Even in countries in which the distinction between a research and a professional Doctorate is not made, there is growing attention to the employability of Doctorate holders for jobs outside academe. As a consequence, there is a gradual, but visible trend toward increased codification and regulation of standards and requirements as well as the duties and obligations of Doctoral candidates, on the one hand, and higher education institutions training Doctoral candidates, on the other. Developments in this direction seem to be most advanced in the United Kingdom, but the Netherlands is following, and other countries are debating higher degrees of regulation including a growing scrutiny of the post-Doctoral phase.

5. CONCLUSIONS: DOCTORAL EDUCATION WITHIN THE EUROPEAN HIGHER EDUCATION AND RESEARCH AREA

Comparing the five basic challenges listed in the document of the European Commission about the role of universities in a Europe of knowledge with the issues and concerns that have been reported in the case studies in this volume, four aspects of reform and change begin to emerge.

- i. Almost all countries under consideration in this study report an increasing duration of time-to-degree. Even those countries that have a more structured Doctoral training system are included. First debates

are beginning about the possible inclusion of Doctoral training into the process of establishing a common architecture of degrees in Europe. Although no country as yet has reported a degree structure, including Doctoral degrees, that is compatible with the Bologna model, reforms of Doctoral education aim at shortening this period of research and study to three years, following the Master's degree or even following the Bachelor's degree. In particular, the United Kingdom reports for Engineering and the Sciences a model of 3+3, while for the Humanities and Social Sciences, it is typically 3+1+3.

- ii. The second aspect is related to the quality of Doctoral studies, which not only includes proper supervision and structured programmes, but also the issue of training for employment outside academe, i.e., emphasis on applied research and models of professional Doctorates. Inherent in this rather complex issue are also debates about ways to deal with heterogeneity including atypical groups of Doctoral candidates as well as co-operation with industry and enterprises in the supervision and setting of research problems for Doctoral theses. The quality of Doctoral education tends to be increasingly measured along the lines of skills-acquisition that also qualify for careers outside academe.
- iii. A third aspect is that of the status of Doctoral candidates. All countries have faced an increasing demand for Doctoral studies, while at the same time having to deal with declining resources. Some countries have chosen to introduce or to increase tuition fees for Doctoral students. Other countries have acknowledged their contribution to ongoing research and teaching and offer Doctoral students regular, although temporary, employment as junior academic staff members.
- iv. The fourth and final aspect is mobility and international co-operation in Doctoral training, also including issues of recognition of previous qualifications and qualifications acquired during periods of Doctoral training abroad. Most countries have recognition procedures in place for Doctoral candidates coming from abroad. But these procedures are sometimes very complicated and highly bureaucratic (e.g., the Austrian *Nostrifikation* procedure or the role of the Russian Department of Credential Evaluation). What interferes most seriously with the issue of mobility and co-operation are trends in certain countries (mainly the United Kingdom and the Netherlands) to scout for best talent internationally and to structure Doctoral education in such a way that there are powerful incentives for Doctoral students not to be mobile at all but rather to remain in one programme. Doctoral students from abroad are welcome in these countries but basically as fee-paying students and as strategic resources, not to be shared with others, in order to gain a competitive advantage. So brain gain in some countries is brain drain in others. As a counter movement, one observes that, within the framework of creating a European Area of Higher Education and Research, increased international co-operation among institutions and programmes is taking place. It remains to be seen whether or not

joint or double degrees in Bachelor's and Master's degree programmes will eventually lead to joint awards of Doctoral degrees as well.

Another aspect of the problem, for which it is still too early to arrive at the final conclusions, should be mentioned here. The Russian Federation and the United States are two countries, included in this analysis, which are not parts of the European Union. They can, however, serve as examples for forming certain hypotheses about how the Bologna Process and the activities to create a European Higher Education and Research Area might relate to or even impact on other UNESCO Member States.

A first hypothesis might be that other UNESCO countries, which are not part of the European Higher Education and Research Area, will take up the challenge and start to compete more fiercely, trying to scout for best talent as well and making attractive offers for Doctoral students from abroad.

A second hypothesis might be that a larger degree of harmonization and co-operation in Doctoral education will be triggered by this process, which will eventually include countries that are not part of the European area.

Finally, a third hypothesis might be one of seclusion and of a new nationalism, *i.e.*, building up a distinctive national system of Doctoral studies and separating from European developments in order to emphasize a different national and cultural identity.

Certainly, the decision taken with the Bologna Declaration to introduce a common architecture of degrees and to give up traditional national degrees will not only change the European higher education landscape but also the relationship between higher education and the world of work. The ambitious goal formulated by the Council of Europe at its Lisbon meeting in 2000, namely, to make Europe the most dynamic and competitive knowledge-based economy in the world, will complement and reinforce the Bologna Process. Eventually, all parts and stages of education and training will be drawn into these developments. Despite the fact that education and training will continue to be a national affair and responsibility, and despite the fact that cultural diversity will continue to be upheld, it will be necessary to pull together all available resources and all available talent to realize these ambitious goals. Doctoral education has been put on the agenda and is currently being scrutinized in terms of what it can contribute to these developments.

The Contributors

ALTBACH, Philip G., Monan Professor of Higher Education, Director

Address: Center for International Higher Education, Boston College
207 Campion Hall, Chestnut Hill
Massachusetts 02467-3813
United States of America
Telephone: +1-617-552-4236
E-mail: altbach@bc.edu

BRATIANU, Constantin, Professor, Director

Address: Center of Strategic and Quality Management in Higher Education
Politehnica University of Bucharest
Splaiul Independentei nr. 313
RO-060042 Bucharest, Romania
Telephone: +40-21-777-4847
E-mail: cbratianu@yahoo.com

BROCH, Ingvild, Research Director

Address: University of Tromsø. Breivika
NO-9037 Tromsø
Norway
Telephone: +47-77-644-262
E-mail: ingvild.broch@adm.uit.no

DE WEERT, Egbert, Researcher

Address: Centre for Higher Education Policy Studies (CHEPS)
University of Twente
P.O. Box 217, NL-7500 AE Enschede
The Netherlands
Telephone: +31-534-893-263
E-mail: e.deweert@cheps.utwente.nl

KEHMM, Barbara, Professor

Address: Centre for Research on Higher Education and Work
University of Kassel
Mönchebergstrasse 17
D-34109 Kassel
Germany
Telephone: +49-561-804-2413
E-mail: kehm@hochschulforschung.uni-kassel.de

HÜFNER, Klaus, Professor. Chairman of the Advisory Board of UNESCO-CEPES

Address: Brucknerstrasse 46a
D-12247 Berlin
Germany
Telephone: +49-30-771-8282; -4525
E-mail: khuefner@aol.com

HYLLSETH, Berit, Counselor

Address: Norwegian Council for Higher Education (UHR)
Pilestredet 46 b
N0-0167 Oslo
Norway
Telephone: +47-22-453-963
E-mail: berit.hyllseth@uhr.no

KNYAZEV, Evgeny A., Professor, Head

Address: International Office
Economic Cybernetics Department
Kazan State University
18 Kremlyovskaya St.
Kazan 420008
Republic of Tatarstan
The Russian Federation
Telephone: +7-8432-315-453; -315-569
E-mail: evgeni.kniazev@ksu.ru; office@ksu.ru

KWIEK, Marek, Professor, Director

Address: Center for Public Policy
Department of Philosophy
Adam Mickiewicz University in Poznan
Ul. Szamarzewskiego 89
PL-60-569 Poznan
Poland
Telephone: +48-618-472-571
E-mail: kwiekm@main.amu.edu.pl

LEMERLE, Jean, Professor, Director

Address: Direction des Relations avec l'Enseignement Supérieur
Centre National de la Recherche Scientifique
3, Rue Michel-Ange
F-75794 Paris Cedex 16
France
Telephone: +33-1-44-96-46-82
E-mail: jean.lemerle@cnrs-dir.fr

MÄHLER, Helena, Project Manager

Address: Department for Research and Policy Advice
National Agency for Higher Education
Box 7851
SE-103 99 Stockholm
Sweden
Telephone: +46-856-308-807
E-mail: helena.mahler@hsv.se

MOSCATI, Roberto, Professor

Address: Department of Sociology and Social Research
University of Milano-Bicocca
Via Bicocca degli Arcimboldi, 8
20127 Milano MI
Italy
Telephone: +39-02-6448-7541
E-mail: roberto.moscati@unimib.it

PECHAR, Hans, Dr., Head

Address: Department for Higher Education Research
Institute for Interdisciplinary Studies (IFF)
Schottenfeldgasse 29
A-1070 Vienna
Austria
Telephone: +43-1-522-4000/ext. 126
E-mail: hans.pechar@univie.ac.at

RUIZ-RIVAS, Carmen, Professor, Programmes Director

Address: Department of Mathematics, Faculty of Sciences
Universidad Autonoma de Madrid
Ctrs. De Colmenar Viejo, KM. 15
E-28049 Madrid
Spain
Telephone: +349-1-497-4888
E-mail: carmen.ruiz-rivas@uam.es

SADLAK, Jan, Dr., Director

Address: UNESCO European Centre for Higher Education (UNESCO-
CEPES)
39, Stirbei Voda Street
RO-010102 Bucharest
Romania
Telephone: +4021-315-99-56
E-mail: J.Sadlak@cepes.ro

TAYLOR, John, Professor, Dr., Director of Studies

Address: International Center for Higher Education Management (ICHEM)

University of Bath

Claverton Down

Bath BA7 7AY

United Kingdom

Telephone: +44-1225-383-304

E-mail: j.taylor@bath.ac.uk

THOMAS, Jan

Address: Institute for Interdisciplinary Studies (IFF)

Schottenfeldgasse 29

A-1070 Vienna

Austria

Telephone: +43-1-5224000-125

E-mail: jan.thomas@univie.ac.at

UNESCO-CEPES PUBLICATIONS

The UNESCO European Centre for Higher Education produces five series of publications:

- The quarterly review **Higher Education in Europe**, published in three language versions: English, French, and Russian;
- **Studies on Higher Education**, which present comprehensive reports on and analyses of major issues in higher education;
- **Papers on Higher Education**, which presents shorter studies and occasional papers;
- **Monographs on Higher Education**, which are studies on national systems of higher education written according to a common outline;
- **Studies on Science and Culture**, which publish the findings of research undertaken by UNESCO Chairs holders collaborating with UNESCO-CEPES – in subject areas other than higher education.

HOW TO ORDER

Subscription orders to the English version of **Higher Education in Europe** must be placed directly with Carfax: Carfax Publishing, Taylor & Francis Ltd.; Customer Services Department; Rankine Road; Basingstoke, Hants RG24 8PR, United Kingdom; E-mail: enquiry@tandf.co.uk. The French and Russian versions can be obtained free of charge through the UNESCO-CEPES website: <<http://www.cepes.ro>>

To purchase volumes in other UNESCO-CEPES series, please check off the titles overleaf. Volumes in the **Studies...**, the **Monographs...**, and the **Studies on Science and Culture** series cost \$20.00 (USD) each. Volumes in the **Papers...** series cost \$15.00 [USD] each. Pre-payment required, please contact us for details.

Complete the following:

Your Name: _____

Institution: _____

Address: _____

Telephone: _____ Fax: _____

E-Mail: _____

And sent by post to:

Publications Unit
UNESCO-CEPES
39, Stirbei-Voda Street
RO-010102 Bucharest
Romania

Date: _____

For additional information about UNESCO-CEPES and its activities, please visit our website at <http://www.cepes.ro>



Studies on Higher Education

- * The Doctorate in the Europe Region (English, 1994, 225 pp.)
- * Standards and Diversity in Architectural Education (English, 1996, 353 pp.)
- * Ten Years After and Looking Ahead: A Review of the Transformations of Higher Education in Central and Eastern Europe (English, 2000, 410 pp.)
- * Transnational Education and the New Economy: Delivery and Quality (English, 2001, 172 pp.)
- * Good Practice in Promoting Gender Equality in Higher Education in Central and Eastern Europe (English, 2001, 160 pp.)
- * System-Level and Strategic Indicators for Monitoring Higher Education in the Twenty-First Century (English, 2003, 238 pp.)
- * Institutional Approaches to Teacher Education in Europe: Current Models and New Developments (English, 2003, 344 pp.)
- * Indicators for Institutional and Programme Accreditation in Higher/Tertiary Education (English, 2003, 215 pp.)
- * Doctoral Studies and Qualifications in Europe and the United States: Status and Prospects (English, 2004, 300 pp.)

Papers on Higher Education

- * Academic Freedom and University Autonomy: Two Perspectives (English, 1995, 85 pp.)
- * La Formation pratique: principes et questionnement (French, 1995, 52 pp.)
- * Report on Higher Education in Bosnia and Herzegovina: Historical Development, Present State, and Needs Assessment (English, 1996, 127 pp.)
- * Mutual Recognition of Qualifications: The Russian Federation and Other European Countries (English, 1997, 124 pp.)
- * The Europeanisation of European Universities: A View from the East (English, 1997, 140 pp.)
- * A European Agenda for Change for Higher Education in the XXIst Century (Changer l'enseignement supérieur en Europe, un

- programme pour le XXI^e siècle) (English and French, 1997, 166 pp.)
- * A European Agenda for Change for Higher Education in the XXIst Century: Twenty Case Studies (English, 1998, 390 pp.)
- * Internationalization of Higher Education: An Institutional Perspective (English, 2000, 97 pp.)
- * Quality Assurance in Higher Education in the Russian Federation (English, 2001, 126 pp.)
- * From Words to Action: Approaches to a Programme (English, 2002, 240 pp.)
- * Policy-Making, Strategic Planning, and Management of Higher Education (English, 2002, 194 pp.)
- * Financial Management and Institutional Relationships with Civil Society (English, 2002, 234 pp.)
- * Quality Assurance and the Development of Course Programmes (English, 2002, 224 pp.)
- * Guidelines for Promoting Gender Equity in Higher Education in Central and Eastern Europe (English, 2003, 110 pp.)
- * Quality Assurance and Accreditation: A Glossary of Basic Terms and Definitions (English, 2004, 84 pp.)

Monographs on Higher Education

- * Bulgaria (2002)
- * Moldova (2003)
- * Ukraine (2004)

Studies on Science and Culture

- * Bioetica în România: teme și dileme (Romanian, 1999, 126 pp.)
- * Politics and Culture in Southeastern Europe (English, 2001, 335 pp.)
- * Sustainable Development: Theory and Practice Regarding the Transition of Socio-Economic Systems towards Sustainability (English, 2001, 306 pp.)
- * South East Europe – The Ambiguous Definitions of a Space – L'Europe du Sud-Est - les définitions ambiguës d'un espace (English and French, 2002, 212 pp.)
- * The Double Helix of Learning and Work (English, 2003, 178 pp.)

August 2004

