



Doctoral Programmes for the European Knowledge Society

Final Report

European University Association



Education and Culture

Socrates

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Executive Summary

Objectives

Doctoral studies are in a process of change today in Europe reflecting the need to adapt research training to meet the challenges of the global labour market, technological advances, new profiles and demands of doctoral candidates, and not least, the policy objectives of European governments. To achieve the ambitious “Lisbon Objectives”, Europe both seeks and needs to increase the number of researchers and research related careers, and doctoral training programmes can be seen as a cornerstone in reaching such a goal. In the context of the “Bologna Process”, doctoral training has gained recently greater importance on the European Higher Education Agenda. In the Berlin Communiqué in 2003, Ministers responsible for Higher Education added a new action line on higher education and research as two pillars of the knowledge society and emphasised the importance of doctoral programmes as the ‘third cycle’ in the “Bologna Process”.

The European University Association (EUA), as the main representative of higher education institutions awarding doctoral degrees in Europe, proposed and launched with the European Commission’s support the present project as a timely initiative to provide some analysis of key issues facing doctoral training. In doing so, EUA set itself two main objectives: to identify essential conditions for successful doctoral programmes in Europe; and to promote and encourage cooperation in the development of doctoral programmes at the European level. 48 universities from across 22 European countries were selected as project participants from an “open call” issued by the EUA to its university membership.

Findings

The main findings of the project address three issues: the Structure and Organization of doctoral programmes; Supervision, Monitoring and Assessment; and Mobility, European collaboration and joint doctoral degrees. The analysis focuses on connecting these issues with innovations and good practices in university experience across Europe.

On the structure and organization of doctoral programmes the study shows a considerable diversity not only across different countries in Europe, but also across universities within the same country and across faculties within the same university. The following issues are examined: disciplinary differences in the organisation of doctoral training; various types of doctoral degrees; training in core and transferable skills; doctoral training and teaching; duration and funding of doctoral training; recruitment practices; and the profile and status of doctoral candidates. Present “good practices” identified in the project demonstrate that establishing common institutional guidelines, codes and regulations, defined clearly at the highest institutional level and providing rules on recruitment, supervision, exams, evaluation and defence of the thesis, can prove to be a highly beneficial

approach for universities in Europe. Individual study programmes (“apprenticeship model”) are questioned as being appropriate to meet the new multiple challenges of research training for careers in a competitive labour market, with an increasing tendency in many European countries towards structured programmes with doctoral candidates grouped in research / graduate / doctoral schools.

Supervision, monitoring and assessment procedures are critically important for the quality of the experience and training of doctoral candidates. The project focuses on qualification requirements, responsibilities and duties of supervisors; training of supervisors; workloads of supervisors; supervision models; doctoral candidates’ progress assessment; requirements for the doctoral thesis and its defence; and finally, the follow-up “tracking” of doctoral candidates’ career outcomes. The project shows that universities are aware of the constant need to sustain and improve the quality of their supervision, monitoring and assessment procedures; innovative practices in such areas as multiple supervision models, personal development plans for doctoral candidates are being developed and adapted to differing institutional traditions

Mobility and European collaboration are an integral part of doctoral training at many universities. Many doctoral programmes seek to provide appropriate mobility mechanisms to enhance the relevant research experience of their doctoral candidates, but there are still numerous obstacles of a legal, administrative, financial, personal and cultural character that limit mobility throughout Europe. Issues focussed upon in the project include international mobility and inter-institutional collaboration; inter-sectorial mobility; joint doctoral degrees and the debate on a “European Doctorate”. Good practices show that mobility can be an important strategic tool of doctoral training, leading to the wider research experience and career development opportunities of doctoral candidates in his/her chosen field, and better research co-operation and networking between institutions

Policy Context

A key innovative feature of the Doctoral Programmes project was the open working dialogue that was established from the outset between its university partners and higher education policy makers and practitioners. Project partners took the initiative to link its activities to the policy debate through their active engagement in a series of major conferences, for example, the Salzburg Conference (February 2005) that was part of the Bologna Process Work Programme 2003 – 2005 and which identified “ten basic principles” for the future development of doctoral programmes, that fed into the formulation of recommendations for the “Bologna Process” Ministerial meeting held in Bergen in May 2005. In this way the project, in spite of its small scale and duration, had an impact on the wider research and policy-making communities across Europe. The project sought to achieve, therefore, an “evidence-based” dialogue reflecting upon the present landscape of doctoral training, current practices and innovations, and issues for reform.

Conclusions

Doctoral programmes are considered to be a crucial source of a new generation of researchers and to serve as the main bridge between the European Higher Education and Research Areas. As such, they have become an official and important part of the political agenda in the Bologna process. However, doctoral training is markedly different from the first and second cycles of higher education. Its main characteristic, which makes it specific, is that the most predominant and essential component of the doctorate is research. Doctoral candidates have to prove their ability to perform original and independent research within a scientific discipline or interdisciplinary collaboration. Individuality, originality and a certain autonomy are important features of the doctorate.

Universities fully recognise that they have responsibility to offer doctoral candidates more than core research disciplinary skills based on individual training by doing research. They are increasingly introducing courses and modules offering transferable skills training and preparing candidates for the careers in various sectors. Crucially, the re-organisation of doctoral training towards structured programmes and training in a wide range of transferable skills in courses or modules requires adequate financing. It should be emphasised that reforms of doctoral education are proceeding at varied paces and, in some countries, the debate on reform is only at the beginning. While the reform of the first two cycles is well underway across Europe, the transformation of doctoral education presents a different order of challenge.

The present project, in common with the experience of other studies, points to the need for more systematic collection of data on doctorate completion rates and career outcomes. For the future implementation of reforms in doctoral programmes to be carried out effectively, the collection and analysis of such “key indicator” data will be essential in measuring the success of structured doctoral programmes in achieving policy objectives.

As a final remark, it is hoped that the present project has worked to increase awareness of the importance of “joined-up” governmental thinking at the level of improving doctoral programmes and career perspectives and the need for coordinated action involving higher education institutions, government ministries for education and research, innovation and technology, national research councils, and the European Commission.

EUA received the mandate of the Bologna Ministers meeting in Bergen in May 2005 to follow up its work on doctoral programmes over the next two years. Thus doctoral programmes and research careers remain at the heart of the Association’s work and the present project will be followed up: through targeted action within the Bologna process resulting in a report to be presented to the next Bologna Ministers meeting in London in 2007; through a project focussing on doctoral careers; and through ‘hands on’ workshops for universities on important issues, for example the organisation of doctoral/graduate schools in a European context.

I. Introduction

Doctoral studies are in a process of change in Europe reflecting the need to adapt research training to meet the challenges of the global labour market, technological advances, new profiles and demands of doctoral candidates, and not least, the policy objectives of European governments. To achieve the ambitious “Lisbon Objectives”, Europe both seeks and needs to increase the number of researchers and research related careers, and doctoral training programmes can be seen as a cornerstone in reaching such a goal.

In the context of the “Bologna Process”, doctoral training has gained recently greater importance on the European Higher Education Agenda. In the Berlin Communiqué in 2003, Ministers responsible for Higher Education included doctoral and postdoctoral levels as the ‘third cycle’ in the “Bologna Process”, as follows:-

“Conscious of the need to promote closer links between the EHEA and the ERA in a Europe of Knowledge, and of the importance of research as an integral part of higher education across Europe, Ministers consider it necessary to go beyond the present focus on two main cycles of higher education to include the doctoral level as the third cycle in the Bologna Process. They emphasise the importance of research and research training and the promotion of interdisciplinarity in maintaining and improving the quality of higher education and in enhancing the competitiveness of European higher education. Ministers call for increased mobility at the doctoral and postdoctoral levels and encourage the institutions concerned to increase their cooperation in doctoral studies and the training of young researchers”.

The European University Association (EUA), as the main representative of higher education institutions awarding doctoral degrees in Europe, proposed and launched with the European Commission the present project as a timely initiative to provide some analysis of key issues related to the structure and organization, financing, quality and innovative practice in doctoral programmes across Europe. In doing so, EUA set itself two main objectives: to identify essential conditions for successful doctoral programmes in Europe; and to promote and encourage cooperation in the development of doctoral programmes at the European level. Viewing universities as principal “stakeholders” in the debate on the “third cycle”, EUA sought to create with this project a “working space” for the sharing and exchange of experience across different institutions, and the identification of key issues and challenges related to the future development of doctoral studies.

The project offered also a unique opportunity for linking its participant university partners with the policy debate, through establishing an “evidence-based” dialogue between the research community

and higher education policy practitioners which took place at relevant major conference and seminars spanning the timeframe of the project: an EUA conference on “Research training as a key to promote a Europe of Knowledge” in Maastricht, in October 2004; a Bologna Seminar on “Doctoral Programmes for the European Knowledge Society” in Salzburg in February 2005; and the 3rd EUA Convention on “Strong Universities for Europe” held in Glasgow in April 2005. In this way, through its engagement in these conferences, the project was able to provide valuable input to the preparations for the subsequent Bologna Conference of Higher Education Ministers held in Bergen, Norway in May, 2005. Taking place in this context, the project was quite fruitful in addressing both of its objectives. Not only did it provide timely perspectives on good practices, experiences and development needs for doctoral programmes in Europe, but it also strongly encouraged inter-institutional cooperation and demonstrated the commitment of universities to contribute directly to the policy debate.

The purpose of this narrative report is to provide a summary of the conduct of the project, and its main results and conclusions. The next section outlines the conduct of the project, presenting the participating universities and the project methodology. The third section presents the main findings of the project which are divided into three sub-sections: Structure and Organisation of Doctoral Programmes; Supervision, Monitoring and Assessment; and Mobility, European Collaboration and Joint Doctoral degrees. The analysis focuses also on cross-cutting issues discussed across the six networks and presents examples of good practices and university experiences. The fourth section considers the policy dialogue on the “third cycle” achieved in the context of the journey of the Bologna process “from Berlin to Bergen”. The final section summarises main conclusions and achievements of the project.

II. Conduct of the Project: Project Partners and Methodology

II. 1. Participating Institutions

II. 1. 1 The Selection Process

On January 15 2004, EUA launched a call for applications to its member universities, with the objective to form six networks which would be working on different aspects of doctoral studies. Four networks were to work on specified themes (see below), a fifth would take a comparative approach and work upon all of the four themes; and finally a sixth group of existing university networks participating in structured joint doctoral initiatives/programmes would be formed to examine questions of European cooperation in joint or integrated doctoral programmes.

From 143 applications received by the association, an independent panel of experts selected 48 universities from 22 different countries. The partners were selected on the basis of the quality of the application and criteria specified in the call for each network. Furthermore the selection committee selected 6 network coordinators.

II. 1. 2 Thematic Networks

Network 1 - Structure and Organization of Doctoral Programmes

Pierre et Marie Curie University (UPCM) Paris 6 (FR) – coordinator
J.W.Goethe University Frankfurt am Main (DE)
University of Tartu (EE)
University of Granada (ES)
Kingston University (GB)
University of Crete (GR)
Warsaw School of Economics (PL)
University of Wroclaw (PL)
University of Latvia (LV)

Network 2 - Financing Doctoral Programmes

Université des Sciences et Technologies Lille (FR) – coordinator
University of Catania (IT)
University of Tilburg – Graduate School (NL)

Cracow University of Economics (PL)
Université Aix-Marseille 3 (FR)
University of Aveiro (PT)

Network 3 - Quality of Doctoral Programmes

University of Newcastle-upon-Tyne (GB) – coordinator
Universitat Autònoma de Barcelona (ES)
University of Bournemouth (GB)
University of Jyväskylä (FI)
Hacettepe University (TR)
University of P. J. Safarik Kosice (SK)
Law University of Lithuania (LT)
University of Miskolc (HU)
Czech Technical University Prague (CZ)

Network 4 - Innovative Practice for Doctoral Programmes

University of Bergen (NO) – coordinator
University of Strathclyde (GB)
Université Jean Monnet Saint-Étienne (FR)
Institut d'Études Politiques de Paris (FR)
University of Salford (GB)
K.U. Leuven (BE)
University of Göttingen (DE)
European University Institute Florence (IT)
University of Ljubljana (SI)
University College London (GB)

Network 5 - All Themes (Control Group)

Karolinska Institutet (SE) – coordinator
University of Girona (ES)
University of Aegean (GR)
University of Warsaw (PL)
Politecnico di Milano (IT)
Università Degli Studi Roma Tre (IT)
University of Leeds (GB)
University of Wolverhampton (GB)

Network 6 - Network of Networks – Joint Doctoral Programmes

Universita degli Studi di Roma – La Sapienza (IT) – co-ordinator

Technical University of Eindhoven (NL)

Universitat Autònoma de Barcelona (ES)

Technical University of Dresden (DE)

University of Maastricht (NL)

University College Dublin (IE)

II. 2. Project Methodology

In developing the project, EUA adopted the following methodology that was designed, given the limited 18 month time frame, to provide an appropriate environment for the participants to compare practices and exchange views with colleagues from different universities and countries.

II. 2. 1 Background Review

In the first phase of the project, the EUA project coordinators reviewed the various studies, reports and sources of information on doctoral studies in Europe, both at the European and national levels. This preliminary mapping exercise helped to further define the objectives and the methodology of the project.

II. 2. 2 Network Coordinators' Meetings

Two meetings of the network coordinators took place during the project. The purposes of these meetings were to assure a certain continuity and coherence across the work undertaken in the six networks and to allow the networks' coordinators to exchange views on issues arising from each network and identify cross-cutting concerns.

A first meeting took place in May 2004 which served as a launch of the networks' activities. During that meeting both the project guidelines (objectives, activities, timeline, structure and methodology) and the financial instructions were discussed and finalised.

The second meeting of the network coordinators took place in October 2004, before the Maastricht Conference on Research Training. The coordinators met with the EUA project coordinators in order to discuss the preliminary conclusions after each had held their two network meetings. Each coordinator

presented the outcomes of these meetings and SWOT analyses to their peers and discussed cross-cutting issues. The structure of the reports to be prepared by each network was also part of the discussions.

II. 2. 3 Internal Network Meetings

Following the first networks coordinators' meeting, each network met twice over a period of six months. The tasks of the networks involved analysis of institutional practices, comparison of policies and practices between network partners, and the development of guidelines and some initial recommendations based upon agreed areas of good practices.

Network partners were asked also to conduct individual institutional assessment through a SWOT analysis of doctoral studies in their respective institutions. This exercise helped the partners in identifying strengths and weaknesses with regards to the conduct of doctoral studies at their institutions and facilitated the discussion between them during their second network meetings.

II. 2. 4 Steering Committee Meetings

In order to assure that the project would benefit from the expertise of an international group of experts, a Steering Committee was put together at the beginning of the project. The group, who first met in January 2004, discussed the methodology, agreed on specific topics to be explored and reviewed the call for applications before it was sent to all EUA members universities. Some members of the Steering Committee were appointed to form the selection committee¹, which met in April 2004 to select the participants of the six networks.

Throughout the course of the project, members of the Steering Committee were kept informed about the activities of the networks. As a group of external advisers on the project, some offered to act as facilitators for meetings held by the networks and also participated in the related above-mentioned Conferences where the project activities were discussed. Towards the end of the project, EUA organised a joint meeting in March 2005 between the Steering Committee and the networks' coordinators. The latter were asked to present the work accomplished by their respective networks, together with the main lines and conclusions of their final report. The Steering Committee took the opportunity to seek clarifications, engage in discussion on the preliminary results of the project and advise on the structure for their final reports. The Steering Committee members were also asked to send any further comments or recommendations to EUA project coordinators. These meetings proved

¹ The members from the Steering Committee not representing any government or European institutions were asked to form the Selection Committee.

to be valuable both for the network coordinators and for EUA's project coordinators in ensuring the progress of the project.

II. 2. 5 Institutional and Network Reports

Partners produced an institutional report after they had completed the activities within their network. These reports described the policies on doctoral programmes within their institution, the results of their SWOT analysis and a proposed action plan for further implementation of best practices. These reports were sent to EUA as well as to the coordinator of the network in which the partners participated.

Each network coordinator then prepared a network report, reflecting both the content of institutional reports and the discussions during the network meetings. These reports presented best practices, points of agreements between networks' members, cross-cutting issues and some recommendations or keys issues the different groups wanted to put forward. These reports, together with institutional reports from each partner, form the basis of the present summary report.

III. Main Findings of the Project: Issues and Practices

III. 1. Structure and Organisation of Doctoral Programmes

III. 1. 1. Organisation of Doctoral Programmes at the Institutional Level

Doctoral programmes represent a crucial part of university education and research. Traditionally, they used to be considered mainly as a gateway to future academic careers. With the rapid increase in the number of doctoral candidates in recent years and major changes in the global labour market, universities face a challenge to reform doctoral programmes in order to adapt to new conditions. The ambitious Lisbon objectives to build Europe as an advanced knowledge-based society, and to increase its competitiveness, have to be reflected in changes in the European higher education and research sectors if these objectives are to be met. The Bologna process has also had an impact with the development of doctoral programmes as the third cycle of higher education, and has further contributed to the debate on the need for change. However, doctoral training is quite different from the first and second cycles of higher education in that its premise lies in the production of new knowledge through original research. Hence, this raises the general question as to whether the “third cycle” should seek to bring about harmonisation to the same extent as at Bachelor and Masters levels of education. It is certainly clear though that doctoral training in Europe is experiencing a necessary period of reflection and change, and that innovations and reforms are underway at both different levels and paces in university institutions.

- **Common Institutional Guidelines, Codes and Regulations**

Doctoral education has always been one of the core missions of a university. Within the overall goal of training of doctoral candidates through research, universities have adopted different approaches on how to achieve this goal. The organisation of doctoral programmes shows a large diversity not only across different countries in Europe, but also across universities within the same country and across faculties within the same university. In some countries, regulations for doctoral programmes are set up at the national level and universities follow such legal requirements. In other countries, university autonomy is much greater and the organisation of doctoral programmes is entirely under the university’s responsibility. Diversity of research and educational traditions and variety of approaches towards organisation of doctoral programmes, on the one hand, can be seen as a European strength. However, universities often do not have common institutional strategies, rules and regulations towards doctoral programmes, and organisation is left to the responsibility of faculties or departments. This can cause fragmentation of doctoral training and inhibit the creation and support of an adequate

research environment. Having a common framework, clearly defined in the guidelines, codes and regulations at the highest institutional level that provide detailed rules on recruitment, supervision, exams, evaluation and defence of the thesis would seem to be a highly beneficial and innovative approach for universities in Europe. Administrative management of doctoral programmes at the university (not faculty) level and open access to common regulations on university websites play an important role in the organisation of doctoral programmes and enhances transparency of the whole process.

Good Practices on Guidelines, Codes and Regulations

University of Bergen (Norway) has introduced an all-encompassing institutional approach to doctoral training with a set of regulations common for all faculties in addition to national regulations and faculty/ institute regulations.

University of Latvia has organised doctoral programmes in a centralised way at the university level with an overall strategy and regulations for doctoral programmes. The Doctoral section of the Academic Department which is responsible for organisation of doctoral programmes is planned to be transformed into an independent Doctoral Studies Centre.

University College London (UK) has developed a Code of Practice for Graduate Research Degrees which specifies rights and duties of the candidate and set of codes on the website covering regulations, procedures, good practice and an Academic Manual.

Czech Technical University in Prague has formed a Code of Practice for studies and examinations in all three cycles of higher education. The Code contains a separate part on doctoral training, which is available on the university website both in Czech and English languages.

The Graduate School of the University Jean Monnet of St. Etienne (France) has developed special software SECODOC to organise and manage its doctoral programmes. The objective is to improve central organisation of courses and modules and to simplify access to information on courses and their availability.

University of Crete (Greece) has organised both Doctoral programmes and Master programmes under the umbrella of Graduate Programmes. This approach saves administrative and research resources and contributes to interdisciplinarity of the programmes. Co-organisation of the two levels of graduate studies has facilitated the development of doctoral curricula with all necessary courses and course instructions.

At the University Autònoma of Barcelona (Spain) the School of Postdoctorate Studies and the Vice-Rectorate are the central institutions which manage all administrative tasks related to the doctoral programmes at the university.

- **Disciplinary Differences in Organisation of Doctoral Programmes**

Heterogeneity of scientific disciplines has a significant impact on the organisation of doctoral education in Europe. Doctoral programmes show considerable differences between disciplines in performing research, linked to different methodologies, scientific tools and ways of analysing the data. It is often disciplinary differences, and not country, cultural or institutional differences, that require specific approaches. These differences have to be taken into account in the organisation of doctoral programmes, but should not be seen as an obstacle to new innovative ways of providing candidates

with the opportunity to acquire better skills and wider experience in an international and interdisciplinary research environment, and of being better prepared for the labour market. Disciplinary differences are important, but they are sometimes overestimated in order to maintain old practices and traditions, and to avoid reorganisation and modernisation of doctoral programmes.

- **Awarding Doctoral Degrees**

As emphasised above, doctoral education and awarding a doctoral degree is one of the core missions of the university. European universities award various types of doctoral degrees: research doctorates (all countries), professional doctorates (UK) or industrial doctorates (e.g. Sweden, Denmark, UK, etc.). If they are all strongly research-oriented and based on comparable quality standards, then the variety of doctoral degrees is not an obstacle, but only a reflection of different research approaches and environments. However, on the basis of the present project's experience, it seems that many universities would prefer a more unified approach towards the types of doctoral degrees awarded in order to prevent further separation of research and education traditions.

III. 1. 2. Structure of Doctoral Programmes

The structure of doctoral training can be characterised as two approaches that commonly co-exist with each other in individual countries throughout Europe.

1. An individual study programme based on an informal to formal working alliance between a supervisor and a doctoral candidate (an apprenticeship model, sometimes described in a less complimentary way as a "master-slave" relationship) with no structured coursework phase;
2. A structured programme organised within research groups or research / graduate / doctoral schools with two phases: a taught phase (mandatory and voluntary courses or modules) and a research phase.

On the basis of the present study, it would appear that individual doctoral programmes (apprenticeship model) are questioned as being appropriate to meet the new multiple challenges of research training for careers in a competitive labour market, although in some disciplines (mainly in social sciences, the arts and humanities) they are still the prevalent model. There is an increasing tendency in many European countries towards structured programmes with doctoral candidates grouped in research / graduate / doctoral schools. These entities, however, cannot be described as conforming to only one organisational model. They are run either at institutional level as mono-disciplinary or multi-disciplinary graduate schools, or through closely-connected departments, research groups, and other research milieus. In some countries graduate schools are developed under the national umbrella of the Ministry of Education (e.g. Finland or France) or in close cooperation with research institutes and funding organisations (such as Max Planck Institute or Deutsche Forschungsgemeinschaft in Germany). They help to incorporate doctoral

candidates into research teams, projects, excellence centres and clusters of centres. When organised at institutional level, they provide a research environment with a common set of rules and codes of practice for all candidates, which also helps to create similar quality requirements. Research / graduate / doctoral schools offer structured discipline-specific and generic training in transferable skills and can be open to interdisciplinary approaches and programmes. An additional positive aspect of research / graduate/ doctoral schools is the social environment which they provide for doctoral candidates who feel then part of a community of doctoral candidates with similar needs and interests.

Good Practices in Structured Doctoral Programmes

There are numerous and growing numbers of these programmes some of which were reflected in the project, as follows:

University of Göttingen (Germany) offers several interdisciplinary structured programmes in conjunction with Max Planck Institute (International Max Planck Research Schools) and Graduate Colleges with DFG (Deutsche Forschungsgemeinschaft).

J. W. Goethe University in Frankfurt am Main (Germany) has established 11 Graduate Colleges, 3 International Max Planck Research Schools, 2 International Postgraduate Programmes and the Frankfurt International Graduate School of Science. More structured programmes and graduate schools are being developed.

University of Miskolc (Hungary) has established seven Doctoral Schools linked to the faculties of the university and supervised by a University Doctoral Council.

Doctoral programmes at the University of Jyväskylä (Finland) are partly performed within national graduate schools funded by the Finnish Ministry of Education. The University coordinates 7 national graduate schools and takes part in 43 of them (2005). In addition, the university has established a number of institutional graduate schools managed by faculty members.

University of Bergen (Norway) has started to develop a strategy of doctoral programmes based on dynamic research clusters and groups with structured training. Research groups have a thematic focus in a strategic field or a strong research area of the university.

At the University of Ljubljana (Slovenia), from 93 doctoral programmes organised at faculty levels, three are now organised and coordinated at the highest university level and are open to inter-faculty, interdisciplinary and international collaboration.

University College London (UK) organises and manages its doctoral programmes through the UCL Graduate School, which covers 72 departments. The School offers training in transferable skills, manages quality assessments, and provides funds for doctoral research and for conference attendance.

Pierre and Marie Curie University in Paris (France) has 16 doctoral schools as a result of a doctoral reform in France and the Bologna process. The schools are organised within the College of Doctoral Schools.

Similarly, Sciences PO in Paris (France) has established a Doctoral School with numerous doctoral programmes and research centres. The focus lies on strengthening the visibility and identity of the Doctoral School in which doctoral candidates feel fully integrated.

- **Training in Core and Transferable Skills**

Universities are most aware of the fact that in order to prepare young researchers for different positions both within and outside academia, and to meet the increasingly multiple skill demands of the global labour market, they need to offer a wide choice of courses and modules as a part of structured doctoral programmes. Various forms of training through lectures, seminars, colloquia or summer schools aim to provide:

1. scientific training in core research skills (research methodology and techniques; research management; analysis and diffusion; problem solving; scientific writing and publishing; academic writing in English; awareness of scientific ethics and intellectual property rights; etc.);
2. training in transferable (generic) personal and professional skills and competences (writing and communication skills; networking and team-working; material/ human resources and financial management; leadership skills; time management; career management including job-seeking techniques; etc.).

Scientific training in core research skills is usually mandatory, but often offered as a free choice from a range of modules or courses. Training in transferable professional and personal skills and competences is offered more on a voluntary basis, but also as a free choice from different lectures, courses or workshops that are designed to fit the individual needs of doctoral candidates. Training in transferable skills is often organised in the form of short-term blocks of lectures and seminars, or summer schools.

- **ECTS (European Credit Transfer System)**

In relation to doctoral training through structured programmes, the issue of the utility of ECTS (European Credit Transfer System) was addressed during the project. There was a lack a consensus on this issue as the opinions of participating scholars and universities differed. In general, ECTS was considered as a useful tool when used in the structured phase of the programme (courses) and for international mobility modules, but not in the research thesis phase for measuring research progress.

- **Research Training and Teaching**

In some European countries teaching is obligatory for doctoral candidates as a part of training in communication and didactical skills (.e.g. Hungary, Slovakia, Czech Republic, the Netherlands etc.). It is important, however, to define an appropriate time limit for teaching duties, and not to use doctoral candidates as a source of cheap labour, a negative tendency which should be avoided. In some countries doctoral candidates are allowed or encouraged to work as teaching assistants for a salary,

which is often used as a source of income in the final phase of doctoral studies when the scholarship grant has ended.

Good Practices on Doctoral Candidates and Teaching Responsibilities

University of Miskolc (Hungary) requires all doctoral candidates to undertake some limited teaching duties with the aim to improve their verbal communication skills.

Full-time doctoral candidates at the Pavol Jozef Safarik University in Kosice (Slovakia) have to participate in teaching activities according to the national law (not more than 4 hours a week).

Doctoral candidates at the Czech Technical University in Prague are involved in teaching activities as a part of their doctoral studies plan (maximum 4 hours a week in the period of 4 semesters).

At the University of Sciences and Technology in Lille (France), doctoral candidates are offered several paid positions of part-time assistants, which provide them with an opportunity to gain an additional income as well as the first teaching experience. The French system offers a Temporary Assistant Position (ATER) to doctoral candidates as a part-time or full-time work for one year.

At Tillburg University (the Netherlands) doctoral candidates (who have status as university employees) are allowed to undertake teaching during the research (thesis) phase up to a maximum of 25% of their time, but only to undergraduate students and with permission of their supervisor.

Technical University in Milan (Politecnico di Milano, Italy) gives the candidates an opportunity to take part in some teaching of graduate and undergraduate students as a form of additional financial assistance.

Doctoral candidates at the University of Wroclaw (Poland) are obliged to run didactic undergraduate classes for not more than 90 hours a year according to the regulations on doctoral programmes.

Doctoral candidates at the Hacettepe University (Turkey) have to undertake two teacher-training courses to develop necessary skills in course design, course delivery and course evaluation.

- **Personal Development Plans**

Some institutions have initiated the procedure of producing a Personal Development Plan (PDP) for each individual doctoral candidate. The PDP helps the candidates to recognise and to articulate skills and competences which they acquire throughout the course of completing their studies. The PDP specifies the training schedule in terms of both scientific and generic skills based on crucial needs of each candidate. The document is self-reflective, developmental and its “ownership” resides with the doctoral candidate and is a growing practice in many universities (under differing titles and formats).

Good Practices in Personal Development Plans

University of Newcastle upon Tyne (UK) is in the process of introducing Personal Development Plans tailored for each candidate.

Similarly, University of Wolverhampton (UK) is piloting a concept of electronic Personal Development Portfolios, in which candidates track their own development of skills linked to specific courses, landmarks and events. This way the candidate will be able to reflect on the totality of the doctoral training experience, which will be useful for career development needs of each candidate.

At the Czech Technical University in Prague each doctoral candidate has an 'Individual Study Plan' prepared together with the supervisor, which has to be given to the Doctoral Programme Committee within a month after the beginning of the studies. After the approval of the plan, it becomes a binding document for both the candidate and the supervisor.

III. 1. 3. Research Environment

- **Research Groups, Clusters and Networks**

Research environment plays an important role in the doctoral candidate's professional and personal development but also in the institutional development of universities. In an increasingly competitive national, European and global framework, it is crucial for universities to focus on achieving a critical mass of doctoral candidates, and on building strong research environments in order to enhance research excellence and international collaboration.

To achieve critical mass of doctoral candidates, new innovative structures of doctoral programmes such as doctoral/ graduate/ research schools need to be developed, as described in section III.1.2. above. In small countries and universities where an adequate critical mass of doctoral candidates cannot be easily achieved, other models may be developed. High quality research work and training can be acquired through the involvement of active research groups, research clusters and networks. These can be defined in the broadest sense from interdisciplinary to inter-institutional and international groupings. In some countries (e.g. Nordic countries) clustering of doctoral candidates from several regions or even from neighbouring countries has proved to be a good practice in creating critical mass and an active research environment which stimulates research collaboration at regional, national and international level.

Research environments vary according to disciplinary differences and their specific development in various institutional, regional and national contexts. The project has tended to illustrate that it is easier and more common to create research environments with research groups and clusters in natural and technical sciences than it is in social sciences, humanities and arts, in which research work is often more individually-based and regionally or nationally oriented in topic content. In social sciences,

humanities and arts virtual, the further development of “online networks” can help to stimulate research environments and research collaboration.

Doctoral candidates as young professionals should always be included as partners and co-researchers in research projects and research groups. It is important to develop protocols within such groups providing a description of the contribution of each member including the doctoral candidates. By integrating doctoral candidates into research groups or clusters in this way they become an integral part of the research community, which can enhance their motivation and performance. In this sense, doctoral training aims to provide **training by research**, not only for research. This approach gives doctoral candidates an extended competence in the specialised research field as well as transferable skills such as solving complex problems, quickly extracting and analysing knowledge, networking, team-working, communication, time and project management, risk and failure management, etc. and hence widens their career perspectives.

Good Practices in Integrating Doctoral Candidates into Research Groups

At the University of Bergen (Norway) the practice of involving doctoral candidates in research groups has been successfully developed. The application for admission to a doctoral programme and the research plan of the candidate has to be formulated in collaboration with a relevant research group. In each case, the rights and responsibilities of the candidate are laid down formally.

Pavol Jozef Safarik University in Kosice (Slovakia) encourages doctoral candidates to apply for a research project within the internal university grant system or the Science and Technology Assistance Agency (Support for Young Scientists) with special attention to interdisciplinary projects that bring together doctoral candidates from different faculties and doctoral programmes. The university supports also research teams of doctoral candidates and undergraduate students to build teamwork and share research experience.

The Czech Technical University in Prague co-operates closely with the Charles University and the Czech Academy of Sciences in bringing together doctoral candidates and researchers from different disciplines and institutions and creating active multidisciplinary research groups.

Working in research groups and networks is a common practice at the Karolinska Institute (Sweden). In medical research, which is the principal domain of Karolinska Institute’s activities, interdisciplinary collaboration of various research groups is a key to research progress. For example, the Cancer Network serves as a platform for co-operation between different research groups in which also doctoral candidates are involved.

III. 1. 4. Duration of Doctoral Programmes

- **Length of Doctoral Studies**

A standard timeframe for completion of a doctoral degree was judged to be 3 to 4 years in case of full-time studies. Participating universities in the project considered a 3-year period as generally too short and if such a time duration was envisaged in the “third cycle” of the Bologna process this raised many concerns related to the maintenance of quality standards. In order to help assure high scientific integrity and quality of doctoral training and a higher completion rate, universities would ideally prefer 4 years full-time and fully-funded doctoral programmes. In any event, it was essential that sufficient time is allocated for the actual thesis work (recommended time is 2.5 years). For multidisciplinary programmes a minimum of a 4 years timeframe should be a rule as it entailed more time to gain necessary competences in required disciplines.

Various factors have an impact on the duration of studies, mainly disciplinary differences. Research in the disciplines based on experiments in laboratories or long-term fieldwork requires certain amount of time that cannot easily be shortened. Other circumstances, often of personal character such as starting a family also have an influence on the length of studies. The gender dimension is an important factor to be taken into account as many female doctoral candidates often have to interrupt their studies during maternity leave. Therefore, a flexible approach to the timeframe of doctoral programmes is crucial.

- **Funding and Duration**

The duration of doctoral studies is inevitably closely connected with funding. Throughout Europe fellowships and scholarships grants tend to have a 3-year limit on funding. As the average completion time of doctoral studies is 4 years, most candidates have to solve their financial situation by finding a job (often as teaching assistants) at the time when they should fully concentrate on the completion of the thesis. In the UK, the problem of duration of doctoral studies has been recently formally recognised by the Engineering and Physical Sciences Research Council which proposes to extend the official length of doctoral programmes to 3 ½ years.

- **Full-time and Part-time Doctoral Studies**

Doctoral training may be undertaken after or during an employment period as a part-time training. There are countries (e.g. UK, new EU Member States) where part-time doctoral candidates constitute a significant proportion of all candidates. Part-time doctoral training requires a longer timeframe than

full-time studies (usually 5 – 6 years). Doctoral candidates are sometimes allowed to combine full-time and part-time form of studies due to their personal or financial situation. With changing demographic trends in Europe, doctoral training may be seen as a part of “life-long learning” in line with the Lisbon objectives. This, however, requires a more flexible approach with regards to both the organisation and duration of doctoral studies for part-time doctoral candidates.

To tackle the problem of duration and to encourage promising students to continue with research, some universities have introduced the possibility to enter a doctoral programme directly after completing a year of a Master degree. The Master programme is then seen as a preparatory phase of a doctoral programme for those students who have ability to continue in doctoral training.

Innovative Practices in tackling Duration/Funding of Doctoral Studies

Master level is seen as an entry point for candidates moving into doctoral programmes e.g. at the Bergen University (Norway) and the Hacettepe University (Turkey).

University College of London and Strathclyde University (UK) offer 1-year Master programmes with the main focus on research which allow successful students to move directly into a doctoral programme.

Similarly, Kingston University (UK) offers 1+3 route, which involves one year of Master level work prior to three years of doctoral studies.

At Sciences Po in Paris (France) a Research Master that has been introduced in 2004 is an entry point to a doctoral programme. 80% of doctoral candidates are recruited directly from research based Master programmes.

III. 1. 5. Recruitment in Doctoral Programmes

- **Diversity of Recruitment Practices**

Practices of recruitment vary across universities and countries. There are several methods for the recruitment of doctoral candidates, mostly based on a competition:

- Entrance examinations and / or an interview
- Master degree and good study results (with no entrance exam or interview)
- Application and a publication (journal article or conference paper)
- CV plus defence of the research project proposal.

Master degree (or equivalent) is the most likely, but not necessarily the only route to doctoral training. Professional qualifications and experience may be also taken into account when selecting the candidates. There is an increasing trend of research Master programmes becoming an entry point for a doctorate, as mentioned in section III.1.4 above.

More university institutions are requiring also a good command of a foreign language from doctoral candidates, most often English as a precondition for mobility and international collaboration requirements in the doctoral programme. Candidates in some countries have also to pass an exam in a foreign language (usually English) as a part of the recruitment process.

- **Selection of Doctoral Candidates**

Selection of candidates should be transparent, fair and consistent with well defined institutional guidelines and codes of practice. Selection is usually undertaken by a research/doctoral Committee/Board or by a supervisor or a group of supervisors. Candidates either present their own research proposal or it is identified in consultation with the supervisor/s. The selection of the candidate is based on the candidate's abilities, interest, enthusiasm, the relevance and innovative nature of the research project, and also on adequate funding arrangements. A clear match between the candidate's research project and research experience of the supervisor is crucial. In case of private companies involvement (e.g. co-funding and co-supervision or full funding provided by a private company), it is important to agree on the conditions of research, intellectual property rights and publishing possibilities at the beginning of the doctoral studies in order to ensure that the company's interests will not compromise academic considerations and the company will not prevent a candidate from presenting the results independently. Doctoral programmes involving such co-funding and co-supervision should seek to guarantee the independence of the research and the publication of results.

Good Practices in Selection Procedures

University Pierre et Marie Curie in Paris (France) selects doctoral candidates in a competition based on the defence of the research project in front of a board (Doctorate Commission), which proved to be an effective method to evaluate the research potential of the candidate and to ensure openness and equity of the selection.

Doctoral candidates at the Johann Wolfgang Goethe University in Frankfurt am Main (Germany) are selected in a two-step process. The first selection is undertaken by the main supervisor or by a group of supervisors (in structured programmes). The second and final decision is made by the department's doctoral committee that decides whether the application and the supervisor's recommendation will be accepted.

University of Leeds (UK) and its faculties publish graduate recruitment handbooks and a prospectus for potential candidates with a list of all doctoral programmes. A candidate (for full-time studies) is initially accepted as a provisional candidate for the doctorate degree concerned. Within a year of starting a decision is taken whether the candidate should continue.

Selection at Warsaw University (Poland) is on a competitive basis with a specially appointed doctoral committee evaluating the abilities of the candidates and their previous achievements (publications or participation in conferences), the presentation of the research project and a written or oral examination. An interview with the candidate plays an important role in the final decision.

At Roma Tre University (Italy), in order to increase participation of foreign candidates in doctoral training, some programmes use new recruitment techniques such as qualification screening instead of written exam.

It should be noted, of course, that the operation of selection procedures based at the university department level can work against the development of **interdisciplinary collaboration**. Despite the growing demands for support for interdisciplinary cooperation at national and European policy level, several universities, and individual scholars particularly, remain somewhat reluctant to embrace this approach in doctoral training. Doctoral candidates who wish to work on interdisciplinary projects are sometimes not supported as a result of rigid selection criteria and problems with supervision, assessment and evaluation of such projects. Candidates may also be advised to choose a less risky research topic in one field which is an easier route to the successful completion of the doctorate. This approach limits innovation, scientific development and cross-disciplinary collaboration. Many universities have moved to support interdisciplinary research with well-structured cooperation across faculties/departments and through the creation of interdisciplinary schools/centres offering flexible curricula that allow doctoral candidates to undertake theses based on interdisciplinary or multidisciplinary research topics.

- **Contract Between the Candidate, the Supervisor and the Institution**

The recruitment process is completed by preparing and signing a contract between the candidate, the supervisor and the institution in which rights and duties of all parties are clearly defined, and the criteria for assessment and monitoring identified. This practice, used at some universities, provides a sound basis for finding solutions to any problems that may arise during the doctoral studies.

Good Practices in Contracts

The Thesis Contract (Chartre des Theses) is a standard practice in France, e.g. at the Pierre et Marie Curie University in Paris and the University Jean Monnet of St .Etienne. The contract is signed by the candidate, the supervisor, the head of the home department and the director of the doctoral school. Its aim is to define the rights and duties of each party (relation between the candidate and the supervisor, the means guaranteed for the research projects, intellectual property, information about the courses and rules of the thesis).

J. W. Goethe University in Frankfurt am Main (International PHD Centre Social Sciences) has implemented a PHD contract (PHD Agreement) defining rights and obligations of the candidate, the supervisors and the institution.

III. 1. 6. Profile and Status of Doctoral Candidates

Who is a doctoral candidate today? The profile has been changing rapidly in recent years. In the past, a doctoral candidate was, in most cases, a person with a deep interest in research and a future career in academic research and teaching. This is not true anymore, although society still tends to maintain the stereotype of people with doctoral degrees as scholars living in their isolated world of academia. There are still, of course, students who strongly want to pursue their career in academia, but there are

a growing number of students who pursue doctoral training for professional knowledge and skill development as preparation to enter other sectors of the society: industry, government and administration, medical and health provision, legal and financial services, NGOs etc. There are many students who decide to take up doctoral training for personal development reasons (e.g. mature students) and to widen their employment opportunities, and those who consider that the completion of their first or second degree may not be sufficient to gain employment in very competitive labour markets. The doctoral candidate today is, therefore, a very diverse figure. Doctoral training programmes are reflecting and tackling this reality through finding the right balance between research, which remains the core element of doctoral education, and the necessary orientation towards a wider labour market.

- **Funding and Status of the Doctoral Candidate**

The status of the doctoral candidate differs from country to country. The doctoral phase can be seen as the first part of a professional career; doctoral candidates are young professionals – early stage researchers - who are trained through undertaking research and who make considerable contributions to the creation of new knowledge, methods and products. Their status is very closely linked to funding opportunities, country regulations and educational traditions. Several types of funding arrangements are in practice:

- grants, scholarships and fellowships (national, regional, EU, public or private, industrial);
- salaries;
- self-financing (often in the case of part-time candidates).

Depending on what kind of funding is provided, candidates have the status of a student or the status of an employee - early stage researcher (or a combination of both). Funding usually covers tuition fees connected with education and living costs. Covering full social security costs is still not the case in many countries and hence doctoral candidates are not entitled to pension rights, unemployment benefits or maternity leave. This can clearly work as a counter incentive to those wishing to enter doctoral studies. Funding that covers fees, living costs and social security regardless of the legal nature of the employment would provide crucial incentives to attract a wide spectrum of students (young graduates, mature students, women re-entering the labour market etc.) to doctoral education and to achieve the completion of doctoral studies. Assuring a greater diversification of financial resources and their management poses a major challenge for universities that offer doctoral programmes and want to achieve a critical mass of doctoral candidates.

Good Practices on Doctoral Funding

The University of Sciences and Technologies, Lille (France), has benefited from the existence of joint financial support from various actors (CNRS – Centre National de Recherches Scientifique, industry, regional authorities, national agencies, and the Ministry of Research). Diverse funding increases the possibility of financing more doctoral candidates, but the procedure of negotiations and recruitment is quite complex.

University of Aveiro (Portugal) has good experience with diverse funding of doctoral candidates. A significant number and different types of scholarships, coupled with the selection process aimed at high quality candidates, enables the selected candidates after one year of studies to apply for external scholarships and this, hence, liberates funds that then may be used for new scholarships. Special funding is also available for candidates participating in international conferences. National legislation (2004) offers candidates the right to health insurance, social services, annual paid holiday and maternity leave.

University Paul Cezanne in Aix-Marseille (France) successfully uses the system of French CIFRE scholarships, which allows a company to hire a doctoral candidate and pay half of his/her salary while the other part is paid by the government. The system works on the basis that the candidate is proposed a work-task strongly related to his/her research mission and is provided sufficient time to complete the thesis.

Both University College London and Strathclyde University (UK) use the UK funding grants with industry (CASE – Co-operative Awards in Sciences of the Environment) for doctoral candidates which involve a joint supervision model (supervisor from an academic institution and from industry/business).

III. 2. Supervision, Monitoring and Assessment

III. 2. 1. Qualification Requirements for a Supervisor

Supervision is critically important for the quality of experience and training of doctoral candidates. Supervisory practices are embedded in national cultures and institutional traditions (e.g. hierarchical patterns of the academic profession). The supervisor's role, his/her title and its meaning differs from country to country (e.g., mentor, tutor, promoter, guide, instructor, coordinator etc.) as do the duties of a supervisor (from irregular contacts when needed, to professional assistance on a regular basis).

- **Qualification Requirements, Responsibilities and Duties of a Supervisor**

Qualification requirements, responsibilities and duties of a supervisor should be clearly defined in institutional regulations at each university and each supervisor should be aware of them. Supervisors' qualifications should include extensive knowledge and research experience in the broad subject area/field of the doctoral candidates' chosen work, and current involvement in research groups and projects preferably with a European and/or international dimension. In most European countries, only

academics with a doctorate and a senior tenured position (full Professor or Associate Professor) can be selected as a supervisor.

Supervisors need to be fully aware of the skills necessary to facilitate the intellectual and personal development of the candidate, his/her training needs and career development perspectives. To ensure supervisors' abilities to fulfil all these tasks, assessments of supervisors can form a part of the doctoral candidate's regular progress plan/report.

To increase the awareness of supervisors' responsibilities, some universities produce handbooks, guidelines and codes for supervisors. This approach has become common and well developed practice particularly at UK universities.

Good Practices on Supervisors' Responsibilities

University of Salford (UK) has introduced a toolkit "Supervisor in a box" which contains all important information for supervisors on their role and duties, how to carry out their collaboration with a doctoral candidate, as well as technical aid for supervision.

University of Newcastle upon Tyne (UK) as well as University of Wolverhampton (UK) deliver a comprehensive handbook for supervisors and doctoral candidates on their roles and duties.

- **Training of Supervisors**

Universities are most aware of the need to sustain and improve the quality of their supervision. Supervisors need be prepared for their roles and further trained in relation to new developments in supervisory practices. Continuous professional development of supervisors needs to be assured as a responsibility of the university. At present, the UK and the Republic of Ireland have national codes of practice in doctoral programmes that involve the obligation of each institution to ensure professional development of supervisors. In addition, government funding for universities in the UK is dependent on training being given to supervisors. Such pressure from funding bodies provides a crucial incentive for universities to introduce training for supervisors and to achieve sustainable quality of supervision.

A viewpoint expressed in the present project suggests that training for supervisors should be a mandatory practice for scholars supervising doctoral candidates. This idea may meet with some resistance from supervisors who prefer traditional ways and attitudes to supervising, but all stakeholders can only benefit from enhanced training: supervisors, candidates and universities. Quality of doctoral training depends highly on supervision. It is, therefore, each university's responsibility to guarantee development of high quality supervision, which is central to the research mission of the university.

Good Practices in Training of Supervisors

At the University of Newcastle upon Tyne (UK) all academics who wish to register as supervisors have to undertake training. In case of their first supervision, they are usually required to act as second supervisor for one complete cycle before becoming a primary supervisor.

A similar training programme for supervisors has been practiced at the Bournemouth University (UK) where all new supervisors are obliged to attend the Graduate School Research Supervision Training Programme and receive the “Guidelines to Supervising Research Students”.

University of Wolverhampton (UK) has had a formal and obligatory programme for new supervisors in operation since 1998. The programme lasts three years and is designed to support a new supervisor through her/his first doctoral candidate. The programme incorporates about 10 hours a year of workshops and seminars, plus a mentoring scheme whereby each new supervisor is assigned an experienced mentor. Successful completion of the 3-year staff development programme plus a successful supervision to doctoral level is regarded as a minimum qualification to become a lead member of a supervisory team.

At the University of Leeds (UK), the Staff and Departmental Development Unit runs courses for supervisors. All staff new to supervision have to undergo training in research degree supervision and examination..

Training of supervisors (tutors) has been organised also at the Karolinska Institute (Sweden). Supervisors participate in courses covering topics such as communication, university teaching, team building, conflict management, examination and evaluation.

- **Workload of a Supervisor**

On the issue of the number of doctoral candidates per supervisor, a common average is from 4 – 6 candidates but there tends to be no specified maximum limit. In many universities, doctoral supervision forms part of a “workload model” for academic staff which ensures that supervisors allocate enough time for each doctoral candidate.

Good Practices in Supervisor Workload

Hacettepe University (Turkey) developed a practice of paying supervisors additional fees for supervisory activities. As a result, supervisors have to allocate a certain amount of time for each candidate within declared timetables, which makes it easier for administrative bodies to monitor the process and control time allocated to each candidate.

Czech Technical University in Prague in its internal regulations on doctoral programmes limits the number of candidates per a supervisor to a maximum of 5.

- **Multiple Supervision Models**

Many universities have introduced models of double, joint or panel supervision which are considered as more open and transparent allowing the doctoral candidate to consult and seek advice from others in addition to her/his main supervisor.

Good Practices in Supervision Models

As examples, the model of supervisory teams and panels is applied at the universities of Jyväskylä (Finland) and Frankfurt am Main (Germany) within structured programmes.

At the Hacettepe University (Turkey) each doctoral candidate has a tutor (from the beginning of the studies) who provides guidance during the coursework period. After the successful completion of a comprehensive exam, a thesis supervisor is assigned to the candidate who provides assistance related to the thesis and research work.

The similar practice of having a tutor (in the first phase of the study) and a supervisor (in the research phase) has been developed at the University of Granada (Spain).

At Bournemouth University (UK) each candidate has a supervisory team comprising of a minimum of two supervisors, of which the first supervisor has overall responsibility for the candidate.

At the Aegean University (Greece), a three-member advisory committee comprising of staff members is appointed to each doctoral candidate. One of the committee members has a role of the supervisor. Departments are encouraged to include an external scholar to the advisory committee.

Mykolas Romeris University of Lithuania has recently introduced a scheme of double supervision.

At the University of Leeds (UK) the candidate is assigned to a team of supervisors in one or more schools. As a minimum, the team consists of a principal supervisor and an advisor. In addition, the candidate has access to a postgraduate tutor. The candidate is entitled to a minimum of twelve meetings with the supervisory team.

II. 2. 2. Monitoring and Assessment

- **Monitoring and Assessment Procedures**

Universities have clear procedures for monitoring and assessing doctoral candidates, but they differ from one institution to another, according to the content of the doctoral programme and to the academic culture and practices. Usually, monitoring and reviewing of the work plan and timelines for each candidate are carried out every 6 or 12 months by a supervisor and reported to a doctoral / research committee (or an equivalent academic body) in a progress report.

Good practices used at several universities are:

1. Regular meetings between the candidate and the supervisor, with records being kept by both parties.
2. Regular review stages, which include some assessment independent from the supervisor (e.g. review panels);
3. Feedback from the candidate on the doctoral programme, training and supervision in forms of assessment and evaluation. However, this requirement may be sometimes difficult to achieve due to the nature of the supervisory relationship.

A system of complaints and appeals, and the possibility of changing a supervisor, are clearly defined only in a minority of university institutions involved in the project. In those universities it forms simply a part of the general university official procedure for appeals and complaints within the existing codes of practice.

The setting-up of a system providing for regular monitoring and assessment helps to identify problems or difficulties which need to be addressed. Whatever the form of assessment, the assessment criteria should be clear and transparent to the candidate and there should be an independent element to the assessment process.

- **Student Logs and Websites**

The project showed that student logs and websites, which have been successfully introduced at several universities, are considered an effective way of keeping a record of supervisory meetings and the doctoral candidate's progress generally.

Good Practices of Student Logs and Websites

The European University Institute in Florence (Italy) provides doctoral training with continuous assessments based on structured programmes, clear and multiple objectives, milestones and deadlines for regular evaluation. Doctoral candidates have personal websites which helps to make updated information on research progress available.

The University of Tilburg (The Netherlands) employs doctoral candidates from the thesis phase (during the coursework phase they are students), and organises regular annual reviews of candidates' performance. Candidates obtain temporary contracts of 1 year and, if they do not perform and succeed in the assessment, the contract is not renewed.

The University of Jyväskylä (Finland) has developed a web-based platform for both full-time and part-time students. The platform serves as a communication forum between the doctoral candidate and the supervisor as well as among doctoral candidates and research community as a whole.

At the University of Salford (UK) many Ph.D. facilities are digitally enabled. Candidates can be assisted this way in conducting fieldwork using various research resources which is beneficial especially for the candidates who are constrained by distance and time factors.

University K. U. Leuven (Belgium) has established a central information system with all data related to each doctoral candidate's study programme (title, supervisor, doctoral plan, doctoral projects, progress reports, abstracts, etc.) with the objective to facilitate the follow-up of the progress of the candidates. All doctoral projects are published on-line in the university database, which gives an overview of doctoral research topics.

University College of London (UK) has made compulsory the use of a Research Student Log. The Log requires candidates and supervisors to discuss research progress and to develop timelines for further training and research. The Log provides the opportunity for the candidates to reflect on their generic and specialised skills training needs.

III. 2. 3. Requirements for the Doctoral Thesis and the Defence

- **Requirements for the Doctoral Thesis**

The doctoral thesis is a core element of the doctorate and a proof of independent research performance and competence of the doctoral candidate. The main quality requirement for any thesis is that it should produce a new insight or knowledge – an innovation in the field, a new scientific method or an application of a known method to a new field. The thesis should present an original piece of research work and place it in the context of the theoretical knowledge and the literature in the field. The thesis (or at least a part of it) should be publishable in a peer reviewed scientific journal or as a peer reviewed book. However, the time lag between submission and publication in many journals is a major obstacle to achieve this goal.

At many universities the defence of the thesis presumes the publication of partial results of the candidate's research. The required number of articles in peer reviewed journals varies from one to five. Prior to submission of the thesis, doctoral candidates in many countries have to pass examinations in the discipline and sometimes in a foreign language, and/ or a final comprehensive doctoral examination. This is often done at the end of the coursework phase of the studies.

Many universities require a declaration signed by the doctoral candidate that the work (thesis) is based on one's own original research. In cases of doctoral candidate's active participation in research groups, universities need to ensure clear rules on co-authorship in order to protect the intellectual property of the doctoral candidate as well as that of the other members of the research group.

- **The Defence of the Thesis**

The defence of the thesis is usually public and the information about it is publicly announced prior to the event (minimum ten days before the event). This practice is common in most European countries, except for the UK where the defence of the thesis is private and it is usually organised as an oral examination (the viva) with one internal and one external examiner.

The thesis is reviewed by two to three reviewers who submit written reviews. The thesis defence committee is composed of internal and external professors and experts in the field including the reviewers. The presence of the supervisor in the defence committee is required in some countries and challenged or forbidden in others. It is suggested that at least one member of the committee comes from abroad to ensure an assessment at an international level. Such a practice, although it poses

additional financial costs, could contribute to improving quality standards of the doctorate across European countries.

The defence itself consists of the candidate's presentation of main points of his/her research work and thesis, followed by an open discussion between the defence committee and the candidate. The decision is made by the committee in a secret ballot and announced to the audience. There are differences between countries in grading the thesis defence. In some countries (e.g. the Netherlands), it is impossible to fail a public defence. In most countries the candidate can fail but should be entitled to follow a complaint procedure if he/she disagrees with the decision of the defence committee.

Good Practices in Thesis Defence

At the University of Granada, to ensure the high quality of the thesis, each doctoral candidate has to receive an authorisation from the thesis supervisor and from the home department before the defence. Once the thesis is authorised, the supervisor is also responsible and judged for the quality of the thesis to a certain extent.

At the Cracow University of Economics a candidate who failed to defend the thesis, but completed all other requirements of the programme, can acquire a certificate of the PhD programme.

At the University of Jyväskylä (Finland) the external evaluation of the thesis precedes the defence. Two external experts evaluate whether permission to publish the thesis and public examination can be granted. After the Faculty's formal permission the candidate revises the thesis to be published. After the public defence in the presence of two opponents, the final evaluation report with a grade is submitted to the Faculty. The candidate is entitled to make a complaint within 14 days.

The defence of the thesis at the University of Bournemouth (and many other UK universities), called the Viva Voce, is private and includes an independent chair, an external examiner, an internal examiner and research supervisors. The Chair is responsible for the administration and s/he ensures that the defence follows all university regulations.

At the Hacettepe University (Turkey) the candidate has to defend the thesis orally in front of an examining panel, consisting of 5 members (at least one from a different university).

III. 2. 4. Follow-up and Tracking of PhD Graduates

Follow-up and tracking of PhD graduates and their further careers is a challenge for most universities. In order to evaluate the value and efficiency of innovation and reform in doctoral programmes and to provide evidence of the ways in which doctoral candidates use their acquired skills, it will be crucial to track doctoral candidates' subsequent careers. On the basis of this present study, this seems to be an area where more work needs to be done.

Only a small number of universities involved in the project carried-out surveys to map the further careers of their doctoral graduates.

Good Practices on Tracking

University of Jyväskylä (Finland) makes regular surveys of its doctoral graduates to identify the sectors in which they have been employed and to follow up their career development.

K. U. Leuven University (Belgium) has developed an “exit pool” to explore the reasons why young researchers (doctoral candidates and post-docs) leave the university, and to follow up their careers afterwards. All doctoral candidates, graduates and researchers leaving the university have to fill in an electronic questionnaire before they leave. The data are then analysed and used in the further development and improvement of studying and working conditions.

The University Autònoma of Barcelona has introduced an innovative system of follow-up of doctoral graduates via an interactive web site (<http://idea.uab.es/graduates.htm>).

University Jean Monnet of St. Etienne (France) established an Observatory of the Graduate School. Its aim is to provide data about the further careers of their PhD graduates and to learn about the strengths and weaknesses of university’s doctoral programmes.

III. 3. Mobility, European Collaboration and Joint Doctoral Degrees

III. 3. 1. Mobility

Mobility is an integral part of doctoral training at many universities. Many doctoral programmes seek to provide appropriate mobility mechanisms to enhance the relevant research experience of their doctoral candidates, but there are still numerous obstacles of a legal, administrative, financial, personal and cultural character that limit mobility throughout Europe. Also, the length of doctoral programmes also has an impact on mobility. A three year time limit for doctorates would decrease possibilities for research stays abroad.

- **International Mobility and Inter-institutional Collaboration**

Successful mobility is based on close and well-organised international and inter-institutional co-operation. Existing mobility programmes for doctoral candidates take various forms - the European Commission Marie Curie programmes, joint doctoral programmes between university institutions, co-tutelle arrangements, international collaboration amongst research groups or simply individual research periods abroad. However, mobility is not always recognised and supported as an “added value” and as a part of career development. In some cases, supervisors are not in favour of mobility of their doctoral candidates, for example, where reintegration after a mobility period can be problematic.

Clearly, mobility should not be seen as a goal in itself, but as one of the strategic tools of doctoral training, leading to the wider research experience of doctoral candidates in his/her chosen field, and better research co-operation and networking between institutions. In general, in a structured doctoral programme, mobility can have a positive impact in terms of doctoral candidates’ additional scientific and generic skills and interdisciplinary experience. It helps young scientists to achieve scientific maturity and independence.

Supporting mobility can enhance contacts and collaboration between research groups and facilitate joint research and doctoral programmes of high quality. Mobility and exchanges during doctoral studies such as research period abroad, or participation in summer schools, play an important role in the future career development of each candidate as well as the fostering of research collaboration in Europe. Many universities have designed various programmes for supporting mobility of their doctoral candidates, ranging from competitive grants to obligatory mobility periods spent abroad.

Good Practices of Institutional Mobility

The University of Sciences and Technologies of Lille (France) provides financial support for short term mobility of doctoral candidates and their participation in conferences abroad.

The University of Catania (Italy,) following the Italian legislation, supports doctoral candidates' mobility by a 50% increase of the candidate's salary during the study period abroad. In addition, the candidates can apply for mobility grants if they wish to attend summer schools or conferences.

The University Jean Monnet of St. Etienne (France) gives doctoral candidates supplementary hours (credits) for mobility and participation in foreign conferences.

At Tilburg University's Faculty of Economics and Business Administration (The Netherlands), a part of each department's budget is available for mobility, international conference fees and travel costs as well as for participation of doctoral candidates in courses offered by other doctoral programmes and networks.

- **Inter-Sectorial Mobility**

Mobility as a concept should not be seen to cover only international (cross-country) mobility, but also inter-sectorial mobility. There are several good practices with this type of mobility particularly between universities and industry, but more and closer collaboration is needed in both directions. Some universities have substantial experience with Industrial PhDs, in which the candidate usually works on a project in industry and has two supervisors (one from university and one from industry).

Good Practices of Inter-Sectorial Mobility

The University College of London (UK) awards an Industrial PhD (EngD), which is based on a close collaboration with industrial partners where the candidate may work as a part of a team of the industrial partner. The University organises collaboration with some industrial partners through the UK Engineering and Physical Sciences Research Council Collective Training Scheme. For example, in the doctoral programme, Global Bioprocess Leadership, over 60 industrial experts provide training and contribute to the programme management, 32 companies participate in collaborative research and over 140 companies benefit from training activities.

The Karolinska Institute (Sweden), as a medical university with a long tradition of collaborative research with industry, has developed numerous doctoral programmes within collaborative interdisciplinary and inter-sectorial biotech and pharmaceutical projects.

The University of Strathclyde (UK) offers professional doctorates targeted at industry (Engineering Doctorates, EngD). The Life Science Interface Training Centre offers cross-disciplinary EngD

programme which combines training in sciences, engineering and medical sciences. All doctoral projects have to involve collaboration with a medical industry company, SME or clinical hospital group.

The University Jean Monnet of St. Etienne (France) with the University of Lyon created CREALYS, an Incubator of Innovative Enterprises in the Economic Area of Rhones- Alpes- West. Its aim is to provide a strong support to the establishment of enterprises based on research activities of university researchers and doctoral candidates.

III. 3. 2. Joint Doctoral Degrees

International mobility arrangements and inter-institutional collaboration may develop into the establishment of joint doctoral programmes and degrees. Several types of structural arrangements of doctoral studies at European universities may currently be called joint programmes. In many cases, however, they are based mainly on inter-institutional and international mobility and collaboration without any common curricula, and thus can be described to some extent as an internationalisation of doctoral degrees.

Joint doctoral degree programmes are generally organised according to certain criteria and principles, including:

- a common programme (curricula) both in training and research as a result of close cooperation of the institutions involved;
- an agreement on funding, and/or other matters of institutional responsibility, such as curriculum, mobility arrangements and quality assurance, signed in advance.

Such joint doctoral programmes tend to be formed as a result of one of two approaches: a) the bottom-up approach, which leads to the establishment of a research network on the basis of co-operation of individual partners or research groups; and b) the top-down approach, which is the initiative of university leaders as a part of institutional strategies often as a response to external opportunities (e.g. EU support for international and inter-institutional collaboration and mobility, government funding opportunities and agreements etc.).

Examples of Joint Doctoral Programme Certification

In practice, examples of joint or collaborative doctoral programme certification include:

1. A doctoral degree issued by the university in which the candidate is enrolled, plus a certificate recognising international mobility of the candidate;
2. A double doctoral degree issued on the basis of a co-tutelle (bilateral inter-institutional agreement signed by the Rectors, which usually involves two supervisors, one from each university, some periods of study and research at the other university for each participating candidate, and a double diploma issued after the defence of the doctoral thesis);
3. A bilateral or multilateral doctorate with a double or multiple degree and a joint certificate with a label such as “Doctor Europaeus”, based on a bilateral or multilateral agreement signed by

the Rectors - with a higher level of curriculum integration and collaboration following informal guidelines prepared by the former Confederation of European Union Rectors' Conferences in 1991, (see paragraph below on the European Doctorate);

4. A single Joint Diploma signed by the Rector of the coordinating university and at least two other Rectors of partner universities in different European countries, on the basis of regulations and agreements of all participating universities, and legally supported by the national Ministries of Education.

Good Practices of Joint Doctoral Programmes Organisation

The University of Munich (Germany) and University College Dublin (Ireland) together with 6 other universities take part in a doctoral programme in Information, Technology and Innovation Management. It is based on multi-disciplinary network collaboration and regulated by inter-institutional arrangements. Common recruitment, quality standards, double supervision in two institutions and a common course programme in English have been developed. The doctoral degree is awarded by the home institution with recognition that the doctorate was completed under the rules of a joint programme.

The Technical University of Eindhoven (The Netherlands) established a Joint European Graduate Research School and Doctorate Network which awards a doctoral degree from the home institution with an additional CLUSTER certificate (at least 15% of credits have to be earned abroad).

The University of Rome "La Sapienza" (Italy,) as a coordinating university, has developed a unique and the first EU-approved European Doctoral Programme on Social Representations and Communication with 12 other partner universities (since 1996). Partner universities belong to the European Scientific Board and are linked through the EC Institutional Contract. The candidates follow the approved training structure using different instruments including open distance learning, virtual tools, forum discussions, video-conferences and annual summer schools as well as structured physical and virtual mobility schemes. The diploma, the European PhD, is issued by the University of Rome "La Sapienza" and it carries logos of 13 partner universities of the European PhD network. The diploma is signed by the Rectors of universities of La Sapienza, Helsinki and Lisbon (3 original partners).

Maastricht University (The Netherlands) has organised an interdisciplinary research programme EURON in the field of neurosciences, which has become a Marie Curie Training Site of ten universities. Training consists of individual supervision on highly specified research topics in the partner institution (with at least two supervisors) and an integrated package of courses (Winter Schools and Fellows Days). The successful candidate receives a PhD diploma from home university and an additional EURON-PhD certificate.

The Technical University of Dresden (Germany) is the coordinating university of a joint doctoral programme International Qualities Network in the field of historic masonry and new masonry constructions. The Programme awards the doctorate from a home university with an additional certificate from the International Qualities Network.

The University of Bergen (Norway) has established a joint doctoral programme with a non-European university, Makerere University in Uganda. Doctoral candidates receive one diploma signed by both universities. Both universities participate in the educational part of the programme and in supervision. Collaboration of the university with developing countries emphasises the need to create real partnerships in order to maximise the value of such collaboration for the research environments in developing countries.

- **European Doctorate**

The debate on the **European Doctorate**, or a European label for a doctoral degree, arose again during the course of the project and tended to bring forth a diversity of opinion and lack of consensus.

The idea of a European Doctorate (European PhD or Doctor Europaeus/ Europaea) originated from an informal initiative in 1991 of the former Confederation of European Union Rectors' Conferences concerning requirements for the awarding of a 'Doctor Europaeus'. The proposed requirements included:

1. The PhD thesis defence will be accorded if at least two professors from two higher education institutions of two European countries, other than the one where the thesis is defended, have given their review of the manuscript;
2. At least one member of the jury should come from a higher education institution in another European country, other than the one, where the thesis is defended;
3. A part of the defence must take place in one of the official languages, other than the one(s) of the country, where the thesis is defended;
4. The thesis must partly have been prepared as a result of a research period of at least one trimester spent in another European Country.

There are pros and cons of the European Doctorate that need to be further considered. On the one hand, the European Doctorate could be seen as a powerful tool for making the Lisbon objectives more visible and for making the doctoral degree more attractive for young people as a symbol of European research collaboration. On the other hand, it can be questioned what "added-value" a European Doctorate brings to a research doctorate awarded at the university level. Disciplinary differences may also play a role in the awarding of European Doctorates. In social sciences and the humanities, comparative research at the European level can bring significant results and may lead valuably to a European Doctorate. In natural sciences and technical disciplines, however, where comparative research is replaced by international collaboration in research groups and networks aimed at solving a common research problem, the European Doctorate may not appear to bring "added value".

The idea of the European Doctorate requires further discussions at the institutional and European levels. There is a wide support among universities for strengthening European and international collaboration and mobility. An open debate on the European Doctorate should be a part of a wider discussion on internationalisation of higher education and research and on building a competitive European Higher Education and Research Area.

IV. The Project in the Policy Context “from Berlin to Bergen”

- **Initiating a Working Dialogue between Practice and Policy**

A key innovative feature of the Doctoral Programmes project was the open working dialogue that was established from the outset between its university partners and higher education policy makers and practitioners. Project partners took the initiative to link its activities to the policy debate through their active engagement in a series of major conferences that fed into the formulation of recommendations for the “Bologna Process” Ministerial meeting held in Bergen in May 2005. In this way the project, in spite of its small scale and duration, had an impact on the wider research and policy-making communities across Europe. The project established an “evidence-based” dialogue reflecting upon the present landscape of doctoral training, current practices and innovations, and issues for reform.

The first opportunity for the testing of this open dialogue and feedback on the project was provided by the EUA Conference “Research Training as a Key to a Europe of Knowledge” (held within the framework of events held under the Netherlands EU Presidency) from 28-30 October 2004 in Maastricht. Several project partners, network coordinators and Steering Committee members were actively involved in the Maastricht Conference as speakers, session chairs and rapporteurs. The Conference provided a timely opportunity for feedback on preliminary findings. The conclusions of the conference were informed by some main lines of evidence emerging from the project. In particular, the Conference recognized that the diversity of traditions in doctoral training throughout Europe should be seen as a factor of strength and that these traditions/ approaches were evolving in different ways in terms of the new models of doctoral programmes being developed, such as graduate schools and industry-linked doctorates. Reforms in doctoral training would need, therefore, to be firmly embedded in institutional policies and practices and each university had to take responsibility for the further development of its policies and regulations governing quality assessment and supervision etc. More structured doctoral programmes were required which prepared new generations of researchers for increasingly specialized fields, but coupled with transferable skill training for a wider range of careers. Universities faced the challenge to build career development strategies, therefore, for a new range of categories of doctoral candidates and to consider also how international mobility mechanisms and inter-institutional cooperation, for example, through linking doctoral programmes to research-driven networks/projects, could provide the necessary “added-value” required to help achieve the Lisbon objectives.

- **The Salzburg “Ten Basic Principles”**

The “Bologna Seminar” on Doctoral Programmes for the European Knowledge Society held in Salzburg, Austria, from 2-5 February 2005 provided the first major forum to discuss the new “Action Line” in the Bologna Process entitled “European Higher Education Area (EHEA) and the European Research Area (ERA) – Two Pillars of the Knowledge-based Society”. The event was held on the initiative of the Austrian Federal Ministry of Education, Science and Culture, the German Federal Ministry of Education and Research and the European University Association. Building upon the momentum of the Maastricht Conference, the EUA Doctoral Programmes project had now achieved a visibility which enabled project participants to air their findings to a wider audience as a contribution to the discussion of the future groundwork required for the successful development of the “third cycle” of the Bologna Process.

In this above respect, the project had clearly proved its value and usefulness. As the Seminar’s General Rapporteur remarked in her report, “The Seminar was a significant development in the cycle of “Bologna process” events in the importance sense that it established a working dialogue amongst both higher education policy practitioners and university researchers and doctoral candidates on the key issue of how to promote closer links between the EHEA and the ERA to improve the quality and competitiveness of European higher education. The high level of researcher participation was built upon largely the EUA Doctoral programmes pilot project, involving 48 universities from 22 countries, whose initial research findings were presented in the Working Group sessions of the Seminar. The substantial involvement of university researchers demonstrated clearly their strong desire to contribute directly to the policy debate on the “third cycle” of the Bologna process concerning doctoral programmes and research training” (General Rapporteur’s Report, Professor Kirsti Koch Christensen, Rector of the University of Bergen, Norway).

The project main findings emerging from the work of the six networks (summarised in section III above) on the structure and organisation, financing of doctoral programmes, supervision and quality assurance measures, innovative practices and joint doctoral programmes helped significantly in identifying the “ten basic principles” on which further work would be required for the implementation of the “third cycle”. These principles are repeated below to underline the valuable synergy achieved in the active dialogue between the university project participants and policy practitioners in linking research evidence with policy development.

1. The core component of doctoral training is the advancement of knowledge through original research. At the same time it is recognised that doctoral training must increasingly meet the needs of an employment market that is wider than academia.

2. Embedding in institutional strategies and policies: universities as institutions need to assume responsibility for ensuring that the doctoral programmes and research training they offer are designed to meet new challenges and include appropriate professional career development opportunities.

3. The importance of diversity: the rich diversity of doctoral programmes in Europe – including joint doctorates – is a strength which has to be underpinned by quality and sound practice.

4. Doctoral candidates as early stage researchers: should be recognised as professionals – with commensurate rights - who make a key contribution to the creation of new knowledge.

5. The crucial role of supervision and assessment: in respect of individual doctoral candidates, arrangements for supervision and assessment should be based on a transparent contractual framework of shared responsibilities between doctoral candidates, supervisors and the institution (and where appropriate including other partners).

6. Achieving critical mass: Doctoral programmes should seek to achieve critical mass and should draw on different types of innovative practice being introduced in universities across Europe, bearing in mind that different solutions may be appropriate to different contexts and in particular across larger and smaller European countries. These range from graduate schools in major universities to international, national and regional collaboration between universities.

7. Duration: doctoral programmes should operate within appropriate time duration (three to four years full-time as a rule).

8. The promotion of innovative structures: to meet the challenge of interdisciplinary training and the development of transferable skills.

9. Increasing mobility: Doctoral programmes should seek to offer geographical as well as interdisciplinary and inter-sectoral mobility and international collaboration within an integrated framework of cooperation between universities and other partners.

10. Ensuring appropriate funding: the development of quality doctoral programmes and the successful completion by doctoral candidates requires appropriate and sustainable funding.

- **The Researchers' Charter and Code of Conduct**

During the lifetime of the project the European Commission published its recommendation entitled the "Researchers Charter and Code of Conduct". While this initiative was not addressed as a central subject within the project's networks, the research findings and evidence produced within the study have an indirect bearing on the future potential implementation of this Commission recommendation. The study revealed a mosaic of different national and regional legal frameworks which govern the conduct of doctoral training, the status of doctoral candidates, their rights, duties and responsibilities within the institutions where they are based. Such frameworks can act as barriers to the early stage

researcher in terms of their career development, particularly in relation to fostering mobility as a key element in establishing Europe as a globally competitive research environment.

Given the centrality of the research mission of universities and their key responsibility for doctoral training, the project findings underscore the point that universities will need to be fully engaged in the future implementation of the Researchers' Charter and Code of Conduct at the national and regional level if they wish to attract and retain high quality doctoral candidates for their research and innovation programmes. Project participants welcomed generally, therefore, the Commission initiative because it sought to make progress on the fundamental issue of how to develop sustainable research careers. In areas such as the extension of the social security and pension rights of doctoral candidates, it was recognised, however, that the financial implications for universities were significant in many countries and would involve consultation and negotiation with all the parties concerned.

- **The Glasgow Third Convention on Higher Education**

From 31st March to 2nd April 2005 the European University Association, in cooperation with the three Glasgow-based Universities, held this convention as a platform for the formulation of the university sector's input into the May 2005 Bergen Inter-Ministerial Conference on the Bologna Process. Over 600 senior representatives from universities were present at this event. One of the key themes of the Convention focussed on how to enhance the research mission of the university. Project participants were prominent in the Glasgow debate on this theme with network coordinators presenting case studies of good practices identified in the study.

On the future development of European doctoral programmes, the Glasgow Convention gave its strong support to the Salzburg "ten basic principles" which were broadly endorsed as a starting point for the "third cycle" of the Bologna Process. It was stressed that the core element of all doctoral programmes was training by research, but not necessarily only for research careers. Participants agreed that doctoral candidates have to receive not only knowledge and skills for research careers in academia, but also for careers in other sectors. Doctoral training was a core element of the research mission of universities, and hence universities held the responsibility for the strengthening of doctoral programmes and their quality assurance, and importantly for developing linked research strategies and career development paths for early stage researchers.

The Glasgow Convention debate also underlined another key element of the work of the Doctoral programme project – the need to develop European/ international dimension in doctoral programmes - mainly through enhanced mobility for fieldwork purposes, working in international research teams, research-driven networks, etc.

- **Bergen Communiqué of the European Conference of European Ministers Responsible for Higher Education (19-20 May 2005)**

The working dialogue between the university research and higher education policy communities on existing practices and innovations in doctoral training, and needed reforms helped indirectly in contributing to the political level agreement reached in Bergen in May 2005. This can be clearly demonstrated in the wording of the Berlin Communiqué which was informed by evidence-based findings from studies such as the Doctoral programmes project:

“The core component of doctoral training is the advancement of knowledge through original research. Considering the need for structured doctoral programmes and the need for transparent supervision and assessment, we note that the normal workload of the third cycle in most countries would correspond to 3-4 years full-time. We urge universities to ensure that their doctoral programmes promote interdisciplinary training and the development of transferable skills, thus meeting the needs of the wider employment market...Overregulation of doctoral programmes must be avoided”.

Contributions to the achievement of political level agreements requires input from many quarters and the Doctoral Programmes project was, of course, only one small research effort, amongst many from the university sector, addressing this issue. Throughout its work the project interacted with other European initiatives and benefited from advice and statements from individual universities, networks and Rector’s Conferences.

V. Concluding Remarks

- **Linking Bologna and Lisbon Objectives – from Bachelor/Masters to the Doctorate**

Doctoral programmes represent a crucial part of university education and research. With major changes in a competitive and diversified global labour market, requiring more mobility, flexibility, adaptability and highly specified expertise, universities face a challenge to reform doctoral programmes in order to adapt to new conditions. The ambitious Lisbon objectives to build Europe as the most dynamic and competitive knowledge-based economy have to be reflected in the changes of European higher education and research. Europe needs more researchers which will be employable in various sectors of the society if it wants to win a leading position in the global economic and technological competition.

Doctoral programmes are considered to be a crucial source of a new generation of researchers and to serve as the main bridge between the European Higher Education and Research Areas. As such, they have become an official and important part of the political agenda in the Bologna process.

However, doctoral training is markedly different from the first and second cycles of higher education. Its main characteristic, which makes it specific, is that the most predominant and essential component of the doctorate is research. Doctoral candidates have to prove their ability to perform original and independent research within a scientific discipline or interdisciplinary collaboration. Individuality, originality and a certain autonomy are important features of the doctorate. While the first two cycles have been built on structured and course-based programmes and examinations, doctoral programmes have been traditionally research-driven without an emphasis on structured courses. Also, importantly, disciplinary differences in conducting research and the individual character of doctoral education (even within structured programmes) pose complications for greater “harmonisation” of doctoral programmes to the same extent as Bachelor and Master programmes.

Universities recognise the challenges of European higher education and research policies and the need to reflect on them in the future development of doctoral education. While the level of the reforms may have different dimensions and paces at each institution, it is clear that doctoral training in Europe is at the crucial point of change and reform. For its part, the European University Association, together with other interested partners, will follow-up actively the mandate given in the Bergen Communiqué to develop further work on the “Salzburg” basic principles for doctoral programmes (to be presented at the 2007 Ministerial Conference).

- **From the Research Literature and Project Findings to Policy Practice**

In designing the project, an overview of the recent literature on doctoral programmes and policy discussions in Europe led to the working hypothesis that doctoral programmes in most countries were moving generally from individual training organised at the level of departments or faculties towards more structured organisation with regulated and standardised approach, based on institutional regulations and guidelines. With the “massification” of higher education, including doctoral education, a growing number of doctoral graduates will be seeking employment outside traditional fields of teaching and research. To enhance their employability, it is crucial, therefore, to continue to develop doctoral training towards a wider labour market in industry, SMEs, public services, NGOs, financial services and other sectors.

Universities fully recognise that they have responsibility to offer doctoral candidates more than core research disciplinary skills based on individual training by doing research. From various surveys on career paths of doctoral graduates carried out either at national level (e.g. Finland) or institutional level, it is evident that doctoral graduates often lack skills needed in industry or enterprise. To cite an example of the research literature on this issue, “Towards European Model of Postgraduate Training” (Ahola & Kivinen, 1999), it is stressed that in industry and commerce, unlike in academia, a doctoral thesis is not seen as evidence of employability. Universities are certainly most aware of this fact and are increasingly introducing courses and modules offering transferable skills training and preparing candidates for the careers in various sectors. There are, however, great regional differences among universities within Europe in this matter. Crucially, the re-organisation of doctoral training towards structured programmes and training in a wide range of transferable skills in courses or modules requires adequate financing. In this respect, new EU Member States and non-EU transition countries are faced with additional challenges resulting from the consequences of structural change (especially decreases in financing of the higher education and research sectors and the impact of “brain drain”).

The project demonstrated clearly that universities are aware of the challenges of the Lisbon objectives, of building the European Research Area, of creating a European Higher Education Area through the Bologna process reforms, and of the globalisation of the labour market. Universities were responding actively to the need for change and reform. However, it should be emphasised that reforms of doctoral education are proceeding at varied paces and, in some countries, the debate on reform is only at the beginning. While the reform of the first two cycles is almost completed in some countries and developing well in others, the transformation of doctoral education presents a different order of challenge. It should be acknowledged that there is a risk of “fatigue” arising from the considerable pressure placed upon limited human and financial resources in many institutions to implement successfully the reforms of the first two cycles of the Bologna process.

- **What did Participating Institutions learn from the Project?**

Most universities stressed how important the project was for them to identify and assess the strengths and weaknesses of doctoral programmes in their institutions. Participation had led to critical discussion among various actors at their institutional level, and the project had provided a timely opportunity for analysis, reflection, decision and change.

The importance and significance of the comparative aspect of the project was valued particularly. Project participants found it most useful to learn what has been achieved at other universities. Participation in the project provided the institutions with an opportunity, therefore, to add a European perspective and international dimension to the development of doctoral programmes and look beyond the national framework – to come out of their “national box”.

The exchange of good practices was considered to be a most useful exercise and several partners have either already implemented or indicated that they would seek to adapt some practices to their institutional context where feasible (especially those related to teaching transferable skills, interdisciplinary programmes and to supervision).

Overall, the project was described generally as an inspiring and valuable experience by partners. Shared knowledge gained from the project has been (or is planned to be) incorporated into institutional strategic plans of a number of participating universities.

- **The Need for more Comparative Data on Doctoral Completion Rates and Doctoral Candidates’ Career Outcomes**

The present project, in common with the experience of other studies, points to the need for more systematic collection of data on completion rates and career outcomes. For the future implementation of reforms in doctoral programmes to be carried out effectively, the collection and analysis of such “key indicator” data will be essential in measuring the success of structured doctoral programmes in achieving policy objectives. Universities have a particular responsibility in establishing sound practices and information bases to collect and up-date such data through surveys and other “tracking” instruments utilising ICT facilities. The project has demonstrated some pioneering good practices in this area, but this constitutes a major challenge for most universities which should be addressed urgently.

- **Designing and Implementing Doctoral Programmes for a European Knowledge Society requires more “Joined-Up” Government**

As a final observation from the results of the project, it is most apparent that the effective “bridging” of the European Higher Education and Research Area in achieving sustainable research careers in a globally competitive European research environment, both in research institutions, industry and other sectors, will require a higher degree of “joined-up” government. From the perspective of universities, it is hoped that the present project has worked to increase awareness of the importance of “joined-up” governmental thinking at the level of improving doctoral programmes and career perspectives and the need for coordinated action involving higher education institutions, government ministries for education and research, innovation and technology, national research councils, and the European Commission.

EUA, Brussels, October 2005

ANNEX 1: CALL FOR APPLICATIONS

DOCTORAL PROGRAMMES PROJECT

Call for Applications
Deadline 15 March 2004

1. INTRODUCTION

Doctoral programmes² are essential to the development of both the European Higher Education and Research Areas, providing a key link between these two processes. Increased support to research is even more important in the context of the ambitious Lisbon and Barcelona goals. If Europe is going to achieve the increase in number of researchers by 700,000 as outlined in the European Commission action plan "*More research for Europe – towards the 3% objective*", it is crucial to ensure research training of high quality.

Universities are the key actors carrying the major responsibility for training researchers at different stages in their careers. They have to face the new challenges of training young researchers for a variety of careers, not only in the traditional academic market, but also in other sectors of the labour market (including industry, business and enterprise, public organisations, independent research centres, etc).

EUA has devised this project to examine the development of doctoral programmes in view of the increasing demands and challenges in Europe. To address the needs of research training in a rapidly transforming knowledge society, it is important to look carefully at the existing structures of doctoral programmes. The primary objective of this project, funded by the Directorate General Education and Culture, and supported by Directorate General Research of the European Commission, is therefore to help European universities to improve the quality of doctoral programmes.

The two main project aims are:

- to identify essential conditions for successful doctoral programmes in Europe;
- to promote cooperation in the development of doctoral programmes at European level.

The project will have high visibility as it will be the main European project on doctoral programmes feeding into the Bologna Process. Outcomes and results will be presented at a number of major European events in 2004/5.

2. ELIGIBILITY

The project is open to all EUA member universities.

3. ACTIVITIES

The project work will be undertaken by six networks of universities:

- Four networks will be working on specified themes (see below). Between six to eight universities will be selected to comprise each of these four networks. Universities are requested to apply on an individual basis, and they will be formed into networks based upon the expressed interest of institutions in a specified project theme. One university within each network will act as the co-ordinating institution, and will have additional responsibilities for

² In this text, the term "doctoral programmes" is used to signify third-cycle studies comprising original research and normally leading to the award of an academic qualification (doctoral title or doctoral degree.)

organising events, writing overall reports, and ensuring that the tight deadlines for project work are met.

- The fifth network will take a comparative approach and work upon **all** of the four themes;
- The sixth network will comprise existing inter-institutional cooperation at doctoral level programmes, and the programme representative is requested to complete the application.

The tasks of the networks will involve analysis of institutional practice, comparison of policy and practice between network partners, and development of guidelines and recommendations based upon agreed areas of good practice or policy. The members of the networks will be expected to participate in two or three project meetings within a period of six months, to undertake background research, and to participate in report writing and the development of recommendations aimed at European universities.

Funding within the project will be available to cover the costs related to project tasks (including staff time and travel costs).

3.1 Four university networks to be formed based on the expressed interest of institutions in one of the following themes:

Theme I Structure and organisation of Doctoral Programmes

This network will focus upon institutional policy for doctoral programmes, in the context of a rapidly changing environment where the conception and use of knowledge, as well as the impact of the Bologna Process, is putting pressure upon traditional structures and practices. The group will compare practice within the participating universities and address issues regarding structural and organisational change. Trends in terms of the length of doctoral programmes, development of recruitment criteria, reform of internal management of doctoral programmes, implications for supervision, and variations between disciplines will all be considered.

Selection Criteria

- Demonstrable experience as a research-training institution across a broad range of disciplines;
- Institutional research policy;
- Institutional experience in reform and development of doctoral programmes.

Theme II: Financing Doctoral Programmes

This network will examine and compare sources of financing for doctoral programmes from two perspectives. Firstly institutional financing will be compared, taking into account sources of funding, financial management, the increasing constraints on universities as well as the need for larger numbers of trained researchers in Europe. Secondly the perspective of doctoral candidates will be addressed, where questions of the legal status of candidates and their salaries/scholarships, access to social security benefits, and financial drawbacks and benefits of embarking upon a research career will be highlighted. From an examination of successful practice, clear recommendations on funding policy as well as on the status of doctoral candidates are the expected outcomes.

Selection Criteria

- Demonstrable financing strategy for doctoral programmes;
- Demonstrable action to fund doctoral candidates;
- Innovative examples of successful funding partnerships.

Theme III Quality of Doctoral Programmes

This network will focus mainly upon institutional policy and action to enhance the quality of doctoral programmes, considering quality from two perspectives. Firstly the network will consider quality in terms of programme structure, academic content, and skill development (research skills and techniques, as well as wider employment-related skills). Secondly the network will examine how the

evaluation of quality is taken into account in existing institutional procedures. The group will also aim to identify good practice examples and provide clear recommendations for future practice.

Selection Criteria

- An existing institutional action plan to improve quality culture, and in particular relating to the improvement of the quality of doctoral programmes.

Theme IV Innovative Practice for Doctoral Programmes

This network will compare experience of developing new and innovative practice for doctoral programmes. Relevant examples which could be developed in a European context should be selected, and may include such initiatives as structured inter-disciplinary programmes, partnerships with industry and business, or the development of graduate (doctoral) schools and the introduction of a European dimension in doctoral training programmes.

Selection Criteria

- Demonstrable examples of innovative practice that merit broader consideration at European level.

3.2 Fifth network to provide a global overview of all themes

In addition to the networks to be formed around specific themes outlined in 3.1, one network will be composed to work upon **all** of the themes to provide a wider and more comparative overview. This network should include universities which consider that their policies are rather comprehensively oriented, addressing jointly all the themes mentioned separately above. Emphasis will be put on the complementarity of the themes and on their corresponding practices.

Selection Criteria

- Clear holistic policy for doctoral programmes, integrating all thematic aspects of point 3.1 above;
- Well-developed doctoral programmes.

3.3. Sixth network "of networks" offering joint doctoral programmes

An additional network consisting of **existing university networks participating in structured joint doctoral initiatives/programmes** will be formed to examine questions of European cooperation in joint or integrated doctoral programmes.

Selection Criteria

This working group is open to networks of universities offering structured inter-institutional doctoral programmes. The application should provide evidence of:

- a minimum of two university partners in two different European countries;
- a clear inter-institutional agreement (e.g. Cotutelle arrangements, joint certificates) with regard to matters such as course requirements and award of qualification;
- an agreed policy between institutions on admission requirements to the doctoral programme;
- well-devised and complementary structure for doctoral courses;
- compulsory mobility for doctoral candidates;
- language policy;
- quality assurance procedures.

In addition, programmes should have been operating for at least 3 years.

4. TIMELINE:

1. Deadline for the call: March 15, 2004
2. Selection of networks (selection committee): April 19, 2004
3. First meeting of selected networks: May 3, 2004
4. Network meetings and action research: June – November, 2004
5. EUA Conference on research training, Maastricht: October 28-29, 2004
6. Final reports: December 31, 2004
7. Salzburg Conference (Bologna Process): January 2005
8. EUA Convention on Higher Education, Glasgow, March 31 - April 3 2005

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i) Except in the case specified in ii) below, a university may only submit one application. The application form is divided into three parts. Part I should be filled out by all applicants. Part II of the application form is directed towards universities who would like to participate in one of the five thematic networks. Part III is for the universities who would like to participate in the network of joint doctoral programmes.

ii) Please note: a university may apply to be a member of one of the thematic networks (outlined in 3.1 and 3.2) and may also participate as a member of a network of joint doctoral programmes (outlined in 3.3).

ANNEX 2: PARTICIPATING PARTNERS

Network 1

Pierre et Marie Curie University (UPCM), Paris 6, France, Professor Jean Chambaz – Coordinator (with the help of Dr Paule Biaudet and Professor Thérèse Hardin)

J.W. Goethe University Frankfurt am Main, Germany, Dr Helmut Brentel

University of Tartu, Estonia, Professor Volli Kalm

University of Granada, Spain, Professor Pamela Faber Benitez

Kingston University, UK, Dr Ralph Manly

University of Crete, Greece, Dr Maria Mendrinou

Warsaw School of Economics, Poland: Professor Janina Jozwiak

University of Wroclaw, Poland, Professor Piotr Sobota

University of Latvia, Riga, Latvia, Professor Ausma Cimdina

Network 2

Université des Sciences et Technologies de Lille, France, Professor Isam Shahrour – Coordinator (with the help of Béatrice Delpouve)

University of Catania, Italy, Professor Giuseppe Ronsisvalle

University of Tilburg, The Netherlands, Professor Harry Huizinga and Jet Ranitz

Cracow University of Economics, Poland, Professor Aleksy Poczowski

Université de Droit, d'Economie et des Sciences, Aix-Marseille 3, France, Professor Pierre Batteau

Universidade de Aveiro, Portugal, Professor Francisco Vaz

Network 3:

University of Newcastle-upon-Tyne, UK, Professor Ella Ritchie – Coordinator (with the help of Dr Stan Taylor, Dr Robin Humphrey and Ms Janet Sharpe)

Universitat Autònoma de Barcelona, Spain, Ms Mireia Gali

University of Bournemouth, UK, Professor John Fletcher/Professor Adele Ladkin

University of Jyväskylä, Finland, Dr Sirkka-Liisa Korppi-Tommola/Dr Ossi Päärnilä

P.J. Safarik University Kosice, Slovakia, Professor Eva Cellarova

Law University of Lithuania, Vilnius, Lithuania, Ms Saule Maciukaite

University of Miskolc, Hungary, Professor Mihaly Dobroka

Czech Technical University Prague, Czech Republic, Professor Ladislav Musilek/Assoc. Prof. Kveta Lejckova

Hacettepe University, Ankara, Turkey, Professor Nuray Senemoglu/Professor Sedat Hakan Ozer

Network 4

University of Bergen, Norway, Professor Rune Nilsen – Coordinator (with the help of Jarle Ronhovd, Jan Petter Myklebust and Kirsty Cunningham)

Université Jean Monnet, Saint-Etienne, France, Professor Bernard Dieterle

Institut d'Etudes Politiques de Paris, France, Professor Marc Lazar/Sébastien Liden

University of Salford, UK, Professor Yacine Rezgui/Professor Amit Mitra

K.U. Leuven, Belgium, Professor Roger Bouillon/ Dr Ann Verlinden

Georg-August University of Göttingen, Germany, Dr Dorothea Mey

European University Institute, S. Domenico di Fiesole, Italy, Dr Andreas Frijdal

University of Ljubljana, Slovenia, Professor Katja Breskvar/Professor Danica Hafner

University College London, UK, Professor Leslie C. Aiello

University of Strathclyde, UK, Micheal Rayner/ Dr Rae Condie

Network 5

Karolinska Institutet, Stockholm, Sweden, Dr Katarina Bjelke – Coordinator

University of Girona, Spain, Dr Josep Vehi

University of Aegean, Greece, Professor Sokratis Katsikas

Warsaw University, Poland, Professor Izabela Sosnowska

Politecnico di Milano, Italy, Professor Roberto Verganti

Universita Degli Studi Roma Tre, Italy, Professor Michele Abrusci

University of Leeds, UK, Dr David L. Salinger

University of Wolverhampton, UK, Professor Jean Gilkison

Network 6

Universita Degli Studi di Roma "La Sapienza", Italy, Professor Annamaria Silvana de Rosa – Coordinator

Technische Universiteit Eindhoven, The Netherlands, Professor Johanna E.M.H. van Bronswijk

Universitat Autònoma de Barcelona, Spain, Professor Jordi Masso Carreras

Technical University of Dresden, Germany, Professor Wolfram Jäger and Dr Krupali Uplekar

University of Maastricht, The Netherlands, Professor H.W.M. Steinbusch

University College Dublin, Ireland, Professor Bernhard Katzy (based in Munich)/Dr Alexandra Bettag

ANNEX 3: STEERING COMMITTEE MEMBERS

Louise Ackers - Director, Centre for the Study of Law in Europe, Department of Law, University of Leeds

Jeroen Bartelse - Head of the Department of Policy, VSNU (Association of Universities in the Netherlands)

Andrzej Ceynowa - Rector, University of Gdansk

Sandra Mukherjee-Cosmidis, Ministry of Education, Science and Culture, Austria

Dagmar Meyer - Chair, Marie Curie Fellowship Association

Sybillе Reichert - Head of Academic Planning, Office of the Vice-president Planning and Logistics, ETH Zurich, Switzerland

Kate Runeberg – Adviser, Nordic Council of Ministers

Priya Bondre-Beil - Programme Director, Deutsche Forschungsgemeinschaft (DFG) Research Training Groups

Christian Siegler - EURODOC

Carles Sola - Former Rector of the Universitat Autònoma de Barcelona

Peter Hassenbach - German Federal Ministry for Education and Research

Lazar Vlasceanu - Programme Specialist and Deputy Director, UNESCO-CEPES

Luc Weber – Former Rector of the Université de Genève

Barbara Weitgruber - Ministry of Education, Science and Culture, Austria

Observers

Peter Van Der Hijden – European Commission - DG EAC

Ettore Deodato – European Commission – DG EAC

Sigi Gruber – European Commission, - DG Research

