

PhD TRAINING AND DEVELOPMENT



3RD CYCLE DEGREES: COMPETENCES AND RESEARCH CAREER

(Background material)

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1. Bologna Process and the Third Cycle

1.1. Third Cycle Entering the Bologna Process

The Bologna Process started in 1999, aiming to achieve greater compatibility and comparability and increase the international competitiveness of the European systems of higher education. In the beginning, the Bologna Process focused only on the first two cycles of higher education. The third cycle was introduced as part of the process in Berlin 2003, in the follow-up meeting of the European Ministers in charge of higher education. Conscious of the need to promote closer links between the European Higher Education Area (EHEA) and the European Research Area (ERA), and of the importance of research as an integral part of higher education across Europe, Ministers considered 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 [12].

The Bergen Communiqué [14] emphasised in May 2005:

We underline the importance of higher education in further enhancing research and the importance of research in underpinning higher education for the economic and cultural development of our societies and for social cohesion. We note that the efforts to introduce structural change and improve the quality of teaching should not detract from the effort to strengthen research and innovation. We therefore emphasize the importance of research and research training in maintaining and improving the quality of and enhancing the competitiveness and attractiveness of the EHEA.

In the London Communiqué 2007, the third cycle was again emphasised. Ministers encouraged Higher Education Institutions to embed doctoral programmes in institutional strategies and policies, and develop appropriate career paths and opportunities for doctoral candidates and early stage researchers. Emphasis was given to crucial issues such as transparent access arrangements, supervision and assessment procedures, the development of transferable skills and ways of enhancing employability.

1.2. Doctoral Education in Europe

Doctoral education in Europe is very diverse. There are many national differences concerning educational systems, quantitative and qualitative study requirements, financing and states of internationalisation. Some countries have well-organised Doctoral Education Systems including Graduate Schools, some countries are only just developing those structures. Graduate Schools are connected to the University Faculties in different ways. European research institutes have also established their own doctoral programmes. There are also great differences in national regulations governing higher education and degrees of higher education. While in some countries there are practically no centralised regulations governing degrees and their goals, some countries have detailed regulations concerning, for example, institutions allowed to give doctoral education or establish graduate schools. Some countries have introduced contracts between institutions and doctoral students which state the rights and responsibilities of both parties, and in some countries supervision practices are still developed quite poorly [16].

The EUA Bologna Seminar “Doctoral Programmes for the European Knowledge Society” was organised in Salzburg in February 2005. The main objective of the seminar was to discuss various aspects of doctoral programmes as the third cycle in the Bologna process, to reach a set of conclusions, identify key challenges and make recommendations for action to be undertaken in the period 2005–2007.

A consensus emerged from the discussions in the Salzburg Seminar on a set of ten basic principles concerning doctoral education:

- The core component of doctoral training is the advancement of knowledge through original research.
- 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.
- The rich diversity of doctoral programmes in Europe – including joint doctorates – is a strength which has to be underpinned by quality and sound practice.
- Doctoral candidates should be recognized as professionals (early stage researchers) – with commensurate rights – who make a key contribution to the creation of new knowledge.
- 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.
- Doctoral programmes should seek to achieve critical mass and should draw on different types of innovative practices 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.
- Doctoral programmes should operate within an appropriate time duration (three to four years full-time as a rule).
- The promotion of innovative structures to meet the challenge of interdisciplinary training and the development of transferable skills.
- Doctoral programmes should seek to offer geographical as well as interdisciplinary and intersectoral mobility and international collaboration within an integrated framework of cooperation between universities and other partners.
- The development of quality doctoral programmes and the successful completion by doctoral candidates requires appropriate and sustainable funding [3].

It is appropriate that different countries and universities have different structural solutions, since choice should be made based on the specific institutional aims which these structures are designed to meet. European higher education institutions have the autonomy to develop their own missions and profiles and thus their own priorities in terms of programmes and research priorities. There is a consensus that there should be no doctorate without original research, and that all awards described as doctorates should be based on core processes and outcomes. Advancement of knowledge through original research is the key component of the third cycle, and this makes it unique and different from the first and second cycles. High quality doctoral programmes are crucial in achieving Europe’s research goals [5].

Even though the doctoral education was brought into the Bologna Process and the reform of degree structures only in 2003, the speed of change has been quite extraordinary. There is still work to be done, and institutions should take responsibility for further developments in this vitally important cycle to sustain and enhance Europe’s research and innovation capacity [5].

The EUA established a Council for Doctoral Education (EUA-CDE) in 2008. The purpose of the EUA-CDE is to contribute to the development, advancement and improvement of doctoral education and research training in Europe. EUA-CDE will work for this goal by organising conferences,

training seminars and other events on topics of interest to its members, by commissioning research and analyses, advocacy, by the provision of information and by the dissemination of good practice. The launching conference of the EUA-CDE was held in Lausanne in June 2008, and as a conclusion from the working groups EUA-CDE will formulate its major priorities and an Agenda for Action.

1.3. Example of Good Practices: Graduate Schools in Finland

Doctoral education in Finland is steered by a few central government regulations, delegated responsibility and autonomy to the universities to design and implement their own doctoral education rules and policies, and a number of mechanisms for funding doctoral studies and research. Funding mechanisms include Graduate Schools, research grants by the Academy of Finland, student doctoral grants by independent foundations, and the basic fund allocations by the Ministry of Education to the Universities in support of academic degrees and research. Basic fund allocation includes funding for a number of “assistants”, who are full-time doctoral students with some duties in department administration and teaching [6].

In Finnish higher education, the introduction of the Graduate School System was an important innovation in 1995. Graduate schools are financed by the Ministry of Education, the Academy of Finland and the universities. As the system has proven to be advantageous, the number of graduate schools has doubled from the original. At the beginning of 2007 there were 119 graduate schools and altogether over 4,000 graduate students working full-time on their doctoral dissertations in graduate schools [8].

The main goal of the Graduate School System is to assure the quality of graduate education, shorten the time it takes doctoral students to write their dissertations and thus lower the age at which doctoral candidates defend their dissertations. The goal is that the students write their doctoral dissertations in four years (after a Master's degree). Important objective of the Graduate School System is also increasing internationalisation. Other goals are increasing co-operation between universities, research institutions and industry, creating innovative research and education environments, and promoting professional careers in research and establishing post-doctoral positions [8].

Graduate schools in Finland are organised as intra-university or inter-university cooperation networks or networks between universities and research institutions. The aim of the graduate schools is not to increase the number of doctoral students, but to educate highly skilled specialists and professional researchers. Graduate schools are also expected to give students so-called transferable skills: for example, group work skills, the ability to popularise results, to lead research projects and to act as part of the international research community [8].

The graduate schools have been successful in making postgraduate education more systematic and more efficient. The median age of doctoral candidates has decreased, and it is now close to 30 years in graduate schools, while in other doctoral education it is closer to 36 years. Studying has been enhanced without damaging the quality of research or education. The Academy of Finland has an important role in evaluating the graduate schools during the application processes and when allocating funding to doctoral courses. The Academy of Finland has now evaluated the applications seven times. Finnish Doctoral Education was evaluated by the Finnish Higher Education Evaluation Council in 2005. The evaluation report “*PhD Training and the Knowledge-Based Society. An Evaluation of Doctoral Education in Finland*” was published in 2006. The external evaluation team pointed out that the Graduate School System strengthens the Finnish doctoral education system and should be continued [6].

2. Aiming to describe learning

2.1. Qualification frameworks

The follow-up meeting of the European Ministers in charge of Higher education in Berlin 2003 set up a goal for all States participating in the Bologna Process to elaborate a framework of comparable and compatible qualifications for their higher education systems. These *national qualification*

frameworks should express the base level for each degree and define degrees based on their workload, level, learning outcomes, competences and profile. Member States were also encouraged to elaborate an overarching framework of qualifications for the European Higher Education Area. The Berlin Communiqué states that:

Within such frameworks, degrees should have different defined outcomes. First and second cycle degrees should have different orientations and various profiles in order to accommodate a diversity of individual, academic and labour market needs. First cycle degrees should give access, in the sense of the Lisbon Recognition Convention, to second cycle programmes. Second cycle degrees should give access to doctoral studies.

The first overarching framework of qualifications of the European Higher Education Area was adopted by the Bergen follow-up conference in 2005. The Bergen Communiqué 2005 states that:

We adopt the overarching framework for qualifications in the EHEA, comprising three cycles (including, within national contexts, the possibility of intermediate qualifications), generic descriptors for each cycle based on learning outcomes and competences, and credit ranges in the first and second cycles. We commit ourselves to elaborating national frameworks for qualifications compatible with the overarching framework for qualifications in the EHEA by 2010, and to having started work on this by 2007.

The EHEA Framework (Appendix 1) comprises three cycles (including, within national contexts, the possibility of intermediate qualifications), generic descriptors for each cycle based on learning outcomes and competences, and credit ranges in the first and second cycles [1].

The development of national qualification frameworks was emphasized in the London Communiqué 2007 [17]:

We note that some initial progress has been made towards the implementation of national qualifications frameworks, but that much more effort is required. We commit ourselves to fully implementing such national qualifications frameworks, certified against the overarching Framework for Qualifications of the EHEA, by 2010. Recognising that this is a challenging task, we ask the Council of Europe to support the sharing of experience in the elaboration of national qualifications frameworks. We emphasise that qualification frameworks should be designed so as to encourage greater mobility of students and teachers and improve employability.

The European Qualifications Framework for Lifelong Learning (EQF) is a second overarching framework of qualifications in EHEA. It has been developed by the European Commission, and signed in 2008 by the Presidents of the European Parliament and of the Council of the European Union, and is therefore formally adopted [11]. EQF is a common European reference framework which links countries' qualifications systems together, acting as a translation device to make qualifications more readable. Its two main goals are to promote citizens' mobility between countries and to facilitate their lifelong learning [15]. The EQF concerning first, second and third cycles are included as Appendix 2.

The first version of the Finnish national qualification framework was written in 2005. It aims to describe the Finnish higher education degrees in a consistent, understandable and comparable way. Distinct description of Finnish degrees aims to improve the quality, transparency and intelligibility of the higher education system. The national qualification framework also aims to increase and facilitate international mobility, simplify recognition of studies and promote lifelong learning [9]. The Finnish national qualification framework concerning the second and third cycle is included as Appendix 3.

As an example of a qualification framework by a single discipline in third cycle is the Finnish National-Level Coordination Project of Degree Programme Development in Teacher Training and the Sciences of Education (Vokke) and their recommendations, which can be found at <http://www.helsinki.fi/vokke/english/redommendations.htm>.

2.2. Learning outcomes

Learning outcomes are today acknowledged as one of the basic building blocks of European higher education reform. The term *learning outcomes* is defined as *statements of what a learner is expected to know, understand and/or be able to do at the end of a period of learning*, in other words explicit assertions about the results of learning. They are concerned with the achievements of the learner rather than the intentions of the teacher (expressed in the aims of a module or a course) [2].

The EQF has eight reference levels describing these statements, regardless of where a particular qualification was acquired. EQF shifts the focus away from the traditional approach, which emphasises learning inputs (length of a learning experience, type of institution) to learning outcomes. Shifting the focus to learning outcomes supports a better match between the needs of the labour market (for knowledge, skills and competences) and education and training provisions, facilitates the validation of non-formal and informal learning and facilitates the transfer and use of qualifications across different countries and education and training systems [15].

Stephen Adam has concluded good practice associated with the creation and implementation of learning outcomes in his report "Learning outcomes current development in Europe, 2008":

- Learning outcomes should be fit for their purpose whether they are employed at the level of the individual module, the qualification, as a level or qualifications descriptor. This means that they should be constructively valuable to the user in question.
- Regular stakeholder input is important in the creation and review of learning outcomes. All learning outcomes should be periodically reviewed.
- Sensitive and constructive support from appropriate national authorities is important to sustain the effort required at institutional level to make a full and successful transition to a higher education system based on learning outcomes.
- The primary goal should be quality enhancement.
- At the level of the module and individual qualifications learning outcomes must be written in the context of appropriate national and international external reference points.
- Learning outcomes must be capable of assessment. Teaching, learning and assessment are part of a continuum that is fundamental to the development of student-centred learning.

The project Tuning Educational Structures in Europe is one of the projects funded by the European Commission, which has provided a basis for developing national qualification frameworks. The Tuning project has as its motto: *Tuning of educational structures and programmes on the basis of diversity and autonomy*. Tuning makes the distinction between learning outcomes and *competences* to distinguish the different roles of the most relevant players: academic staff and students/learners. The academic staff, preferably involving student representatives in the process, is responsible of formulating the learning outcomes, while competences are obtained or developed during the process of learning by the student/learner. In other words:

- *Learning outcomes are statements of what a learner is expected to know, understand and/or be able to demonstrate after completion of learning. They can refer to a single course unit or module or else to a period of studies, for example, a first or a second cycle programme. Learning outcomes specify the requirements for award of credit.*
- *Competences represent a dynamic combination of knowledge, understanding, skills and abilities. Fostering competences is the object of educational programmes. Competences will be formed in various course units and assessed at different stages [18].*

The Tuning project has also highlighted the fact that time and attention should also be devoted to the development of generic competences or *transferable skills*, even though the subject specific skills are the core of the degree. Transferable skills refer to any and all disciplines, e.g. communication and teamwork skills. Transferable skills are becoming more and more relevant for preparing students well for their future role in society in terms of employability and citizenship [18].

The Bergen Communiqué 2007 gave the EUA a mandate to prepare a report on the further development of the basic principles for doctoral programmes for the 2007 London Conference of Higher Education Ministers. In this report, *“Doctoral Programmes in Europe’s Universities: Achievements and Challenges”* (2007), EUA paid attention to the importance of transferable skills: *“Transferable skills development should be an integral part of first, second and third cycle programmes. The main goal at the level of the third cycle should be to raise awareness among doctoral candidates of the importance of both recognising and enhancing the skills that they develop and acquire through research, as a means of improving their employment prospects both in academia and on the wider labour market [7].”*

3. Internationalisation of Doctoral Education

3.1. Internationalisation at the European Level

The EUA report about Doctoral Programmes in Europe’s Universities (2007) recognised doctoral programmes as one of the important elements in the institutional strategies for enhancing internationalisation. According to the report, doctoral programmes are a key component of the discussion on European higher education in a global context. At institutional level attracting the best doctoral candidates from all over the world, encouraging mobility within doctoral programmes and supporting European and international joint doctoral programmes and co-tutelle arrangements are central to the development of any international strategy. EUA encouraged universities to enhance their efforts to support mobility at the doctoral level within the framework of inter-institutional collaboration as an element of their broader international strategy. International mobility, including transsectoral and transdisciplinary mobility should also be recognised as having an added value for the career development of early stage researchers. Some smaller countries may even use mobility to train their own early stage researchers in disciplines and transdisciplinary research areas where a critical mass of doctoral candidates, or capacities or infrastructure does not exist or is not available at home.

Funding and legal issues should be arranged for enhancing internationalisation. Higher education institutions, and public authorities at the national and European level, should offer funding instruments facilitating the mobility of doctoral candidates from all 46 Bologna countries. In the EUA Trends report 2007 it was noted that there is a lack of financial support at the European level for the type of mobility that doctoral candidates would appreciate. Shared supervision or co-tutelle arrangements are suitable for some, but there is a greater need to cover short-term mobility. There is also a need to use money flexibly during the course of a doctoral programme, since nowadays students mobility arrangements are often made by their faculty or department for irrelevant reasons. There is also insufficient recognition of the added value of mobility for the career development of early stage researchers. Legal, administrative and social obstacles, for example concerning visas, work permits and social security issues, should be addressed by all partners in the process [5].

The EUA report pointed out that increasing internationalisation inside universities, especially at doctoral level, should not be forgotten. Doctoral training is *per se* international in nature, and sufficient opportunities should be provided for doctoral candidates to engage internationally. There are multiple ways to do this. Nowadays it is easy to recruit international staff. Guest speakers can be invited by organising international workshops, conferences and summer schools. A more advanced form of international co-operation is the development of more European and international joint doctoral programmes and co-tutelle arrangements. The use of new technologies, such as using teleconferences, e-learning etc., should also be used to increase the internationalisation of staff and students in doctoral programmes [7].

3.2. Increasing internationalisation in Finnish doctoral education

In 2002 the Ministry of Education appointed a committee chaired by Director Sakari Karjalainen to look into the further development of research training. The committee investigated the situation

in doctoral education in Finland from many angles, heard a number of stakeholders and also examined doctoral education in other countries and especially the impact of the Bologna process and postgraduate education policy more widely at the European level. The report of their work was published in 2006. The committee saw as one of the challenges in doctoral education increasing internationalisation in graduate schools. The report put forward 52 recommendations for the further development of doctoral training, including

- The universities and their graduate schools will cooperate with universities, research institutes and doctoral programmes in other countries by means of joint training, research collaboration and joint measures to promote the mobility of doctoral students.
- The proportion of foreign students in graduate schools will be raised to 20% on average by 2012.
- The Academy of Finland defines (also in future) the criteria for Graduate School funding in a way that it encourages Graduate Schools for active international collaboration and international mobility of the doctoral students [16].

The evaluation report of Finnish Doctoral Education by FINHEEC concluded six significant recommendations to guide continuing quality assessment and improvements in the overall system. One of the recommendations was to *“Encourage Further Internationalization of the Doctoral Education System”*.

The report reminded that the stated goal of doctoral reform is to make Finnish doctoral education more internationally competitive both in terms of its academic standards and in its capacity to attract resources and able individuals from other countries. The evaluation of the Graduate School system implemented by the FINHEEC revealed that a number, but not all, of these schools were well connected to other universities outside Finland and were attracting both foreign students and visiting researchers. The evaluation team presented three ways to better attain this goal [6].

The first proposal was to include evidence of active involvement in relevant established Nordic and EU doctoral school networks as one of the criteria for the establishment and renewal of Graduate Schools funded by the Ministry of Education. The second proposal was that internationally available test scores should be considered for inclusion as one of the criteria for the admission of foreign doctoral students. They also recommended expansion of four-year doctoral research grants, which would also assist in the recruitment of able international students. The third proposal was that the Ministry of Education should consider establishing a highly visible and attractive program of International Visiting Professorships that would provide up to a year of support for foreign researchers to be in residency at Finnish centres of research excellence. These professorships should be awarded on a competitive basis among the universities based on a formal proposal [6].

The current goal in Finland is to increase the share of foreign doctoral students in graduate schools to 20% on average by 2012. International cooperation is one assessment criteria in the ninth call for graduate school applications, which is currently open.

4. Research Career

4.1. Researchers in Europe

Awareness of the importance of career opportunities for Doctoral Candidates was raised in the London Conference of European Ministers responsible of Higher Education in 2007. Institutions were encouraged to develop appropriate career paths and opportunities for doctoral candidates and early stage researchers, and emphasis was given to crucial issues such as transparent access arrangements, supervision and assessment procedures, the development of transferable skills and ways of enhancing employability.

The internationally recognised Frascati definition describes research as follows:

“Research and experimental development (R&D) comprise creative work undertaken on a systematic basis in order to increase the stock of knowledge, including knowledge of man, culture and society, and the use of this stock of knowledge to devise new applications”.

According to the Frascati definition, researchers are described as:

“Professionals engaged in the conception or creation of new knowledge, products, processes, methods and systems, and in the management of the projects concerned” [13].

The European Commission has made a recommendation on the European Charter for Researchers and on a Code of Conduct for the Recruitment of Researchers in 2005 [4]. The recommendation relates to all persons professionally engaged in R&D at any careerstage, regardless of their classification. A distinction is made between Early-Stage Researcher and Experienced Researcher. Early-Stage Researcher refers to researchers in the first four years (full-time equivalent) of their research activity, including the period of research training. Experienced researchers are defined as researchers having at least four years of research experience (full-time equivalent) after receiving a university diploma giving then access to doctoral studies in the country in which the degree/diploma was obtained or researchers already in possession of a doctoral degree, regardless of the time taken to acquire it.

The Charter and the Code of Conduct contain recommendations to Member States in order to develop and maintain a supportive environment and working culture for research and researchers. According to the Commission Recommendations, the Member States should transpose these general principles and requirements within their area of responsibility into national regulatory frameworks or sectoral and/or institutional standards and guidelines. These recommendations should affect employers and funders of the researchers, as well as mobility and social security coverage.

The European Charter for Researchers is a set of general principles and requirements which specifies the roles, responsibilities and entitlements of researchers, employers and/or funders of researchers. The principles concerning researchers cover research freedom, ethics, professional responsibility and attitude, contractual and legal obligations, research communication and leadership. The principles concerning employers and funders cover, among others, non-discrimination, the research environment and working conditions, stability and permanence of employment, the value of mobility and evaluation/appraisal systems. In relation to career development the Charter recommends that employers and funders of researchers should draw up a specific career development strategy for researchers at all stages of their career, regardless of their contractual situation, including researchers on fixed-term contracts.

The Code of Conduct for the Recruitment of Researchers notes that the recruitment process should be efficient and transparent, and candidates should be evaluated by a selection committee with diverse expertise and competences. The recognition of mobility experience (also in another research setting) is emphasised.

4.2. The Finnish Four-Stage Research Career Model

In Finland, the national policy for doctoral education in the current decade has been to increase the number of new doctors. The new doctors also have to be able to find jobs outside the traditional fields, such as universities and research institutes, and this requires new measures and a fresh view of the goals of doctoral education.

The Finnish Ministry of Education published a report *The Four-Stage Research Career Model* in April 2008. It is based on the work of the working group “Realising a Research Career”. The working group has put into specific terms the objectives and methods of the operational programme for developing researcher training and research careers (2007–2011, published by the Ministry of Education in 2007), and with which the prevailing practices involved in a research career are being made a part of universities’ positive personnel policies and the Academy of Finland’s responsibility for developing research careers [10].

The working group’s suggestions are based on the four-stage research career model, aiming at a more transparent, more predictable and more egalitarian research career. This model is designed particularly for universities. One key issue in this report is the idea of a tenure track, a career path leading to a permanent position. This has been a major challenge for research careers in Finland. One objective of the model is also to improve the “researcher brand”.

The first stage of the research career model consists of **early stage researchers** working on their doctoral dissertation. Due to this report the term “doctoral candidate” will be replaced by more European “early stage researcher” in the Finnish higher education terminology. The second stage is the career phase of **researchers** who have recently completed their doctorate. This stage, as well as the early stage researcher stage, consists mainly of temporary positions. The third stage consists of **independent research and education professionals** capable of academic leadership, and the fourth stage is that of **professorship**. The last two stages are to be permanent positions.

According to the report, it should be possible to develop aspects within the system, such as components that encourage mobility, advancement opportunities as a result of successful research and opportunities, to establish permanent positions. Universities must also adopt a flexible method of establishing permanent positions both within the stages as well as in the phases between them. The proposed system aims at supporting and facilitating transfers back and forth between universities and other actors (research institutes, companies, the civil service) by, for example, readjusting the method of evaluating qualifications acquired by researchers outside their academic work using the system’s qualification descriptions.

The working group suggests that the career model is to be used as a mean for considering funding. The Ministry of Education should take into account the implementation of the four-stage research career system in universities when considering their funding and management by results. In the management by results procedures between research institutes and ministries, the perspective of the researcher’s career should also be discussed. According to the working group suggestions, the promotion of research careers should be a more important aspect in the activities of public research financing and trust funds in the near future.

According to the report, the four-stage research career system aims to support and facilitate transfers back and forth between universities and other actors, such as research institutes, companies, the civil service etc, which are also important career paths for researcher. The four-stage career model aims to readjust the method of evaluating qualifications acquired by researchers outside of their academic work using the system’s qualification descriptions.

The working group highlights the importance of international mobility in research career development. The report suggests that international co-operation is considered a systematic part of research education. Doctoral education should be considered a part of international co-operation agreements. Post-doctoral international mobility to and from Finland must be increased by, for example, unifying regulations at the European level and by adopting a plan of action by which social security and advancing in one’s career is not negatively affected by periods abroad.

5. Finnish National Seminar on Internationalisation of the Third Cycle (April 2008)

The goal of the seminar working groups was to produce recommendations concerning the types of learning outcomes seen as desirable from the point of view of the international scientific community and of internationalizing working life. Since it is difficult to isolate internationalization from other areas, the discussions of the working groups did not stick strictly to this topic. Therefore, some of the recommendations are of a very general nature. The following recommendations emerged from the discussions of the three working groups:

1) More attention should be paid to developing the knowledge and skills needed for doctoral-level studies at the bachelor’s and master’s level. Such knowledge and skills include critical scientific thinking skills and the ability to carry out long-term independent work.

2) The selection of young researchers should be flexible, but according to clearly defined criteria. Doctoral candidates should not be accepted on the basis of registration; only the most motivated and qualified candidates should be accepted. Quality should be the primary criterion in student selection, not quantity. The goals of the research group or community should be the starting point, since studying in research groups has been proven more effective than studying outside the research community.

3) The individual goals and development needs of doctoral candidates should be charted at the beginning of their studies, and a personal study plan should be made for each student which is more concrete than the research plan. Career possibilities should also be taken into account from the beginning.

4) Doctoral studies should include courses other than those from the student's own discipline. In addition to independent research work, there is a need for courses common to various graduate schools, which would be arranged on a regular basis. The transferable skills of the candidates would also be fostered in such common courses.

5) The guidance process as a whole plays a significant role in the attainment of learning outcomes. More attention should be paid to the quality of guidance and to the rights and responsibilities of supervisors and candidates.

6) Systematic international cooperation should be developed with special attention to common doctoral programmes. In order to make the work of universities easier and map the limits of legislation, recommendations should be drawn up at the international level concerning the implementation of doctoral programmes.

7) Increasing internationalization demands increased investment of resources. This is particularly true in the fields of marketing and recruiting.

8) However, the most important factors from the point of view of internationalization are the high quality of teaching and research, excellent learning outcomes and a good reputation. These should be continually developed.

9) Internationalization should be seen as a natural part of all training and research based on the activities of the scientific community; it cannot be developed separately. International mobility, as well as the number of young researchers sent out and received by Finland, must increase. In order to ensure an increase in internationalization, all these factors must be in order: guidance, teaching and transition to working life.

10) The career opportunities of researchers must be improved in Finland.

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APPENDIX 1. The Framework of qualifications for the European Higher Education Area

	Outcomes	ECTS Credits
First cycle qualifications	Qualifications that signify completion of the first cycle are awarded to students who: <ul style="list-style-type: none"> - have demonstrated knowledge and understanding in a field of study that builds upon their general secondary education, and is typically at a level that, whilst supported by advanced textbooks, includes some aspects that will be informed by knowledge of the forefront of their field of study; - can apply their knowledge and understanding in a manner that indicates a professional approach to their work or vocation, and have competences typically demonstrated through devising and sustaining arguments and solving problems within their field of study; - have the ability to gather and interpret relevant data (usually within their field of study) to inform judgments that include reflection on relevant social, scientific or ethical issues; - can communicate information, ideas, problems and solutions to both specialist and non-specialist audiences; - have developed those learning skills that are necessary for them to continue to undertake further study with a high degree of autonomy. 	Typically include 180–240 ECTS credits
Second cycle qualification	Qualifications that signify completion of the second cycle are awarded to students who: <ul style="list-style-type: none"> - have demonstrated knowledge and understanding that is founded upon and extends and/or enhances that typically associated with the first cycle, and that provides a basis or opportunity for originality in developing and/or applying ideas, often within a research context; - can apply their knowledge and understanding, and problem solving abilities in new or unfamiliar environments within broader (or multidisciplinary) contexts related to their field of study; - have the ability to integrate knowledge and handle complexity, and formulate judgments with incomplete or limited information, but that include reflecting on social and ethical responsibilities linked to the application of their knowledge and judgments; - can communicate their conclusions, and the knowledge and rationale underpinning these, to specialist and nonspecialist audiences clearly and unambiguously; - have the learning skills to allow them to continue to study in a manner that may be largely self-directed or autonomous. 	Typically include 90–120 ECTS credits, with a minimum of 60 credits at the level of the 2nd cycle

Third cycle qualification	Qualifications that signify completion of the third cycle are awarded to students who: - have demonstrated a systematic understanding of a field of study and mastery of the skills and methods of research associated with that field; - have demonstrated the ability to conceive, design, implement and adapt a substantial process of research with scholarly integrity; - have made a contribution through original research that extends the frontier of knowledge by developing a substantial body of work, some of which merits national or international refereed publication; - are capable of critical analysis, evaluation and synthesis of new and complex ideas; - can communicate with their peers, the larger scholarly community and with society in general about their areas of expertise; - can be expected to be able to promote, within academic and professional contexts, technological, social or cultural advancement in a knowledge based society.	Not specified
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APPENDIX 2. The European Qualifications Framework for Lifelong Learning (EQF), levels 6-8.

	Knowledge	Skills	Competence
	In the context of EQF, knowledge is described as theoretical and/or factual	In the context of EQF, skills are described as cognitive (involving the use of logical, intuitive and creative thinking) and practical (involving manual dexterity and the use of methods, materials, tools and instruments)	In the context of EQF, competence is described in terms of responsibility and autonomy
Level 6 * The learning outcomes relevant to Level 6 are	- advanced knowledge of a field of work or study, involving a critical understanding of theories and principles	- advanced skills, demonstrating mastery and innovation, required to solve complex and unpredictable problems in a specialised field of work or study	- manage complex technical or professional activities or projects, taking responsibility for decision-making in unpredictable work or study contexts - take responsibility for managing professional development of individuals and groups

Level 7 ** The learning outcomes relevant to Level 7 are	- highly specialised knowledge , some of which is at the forefront of knowledge in a field of work or study, as basis for original thinking and/or research - critical awareness of knowledge issues in a field and at the interface between different fields	- specialised problem-solving skills required in research and/or innovation in order to develop new knowledge and procedures and to integrate knowledge from different fields	- manage and transform work or study contexts that are complex, unpredictable and require new strategic approaches - take responsibility for contributing to professional development and practice and/or reviewing the strategic performance of teams
Level 8 *** The learning outcomes relevant to Level 8 are	- knowledge at the most advanced frontier of a field of work or study and at the interface between fields	- the most advanced and specialised skills and techniques, including synthesis and evaluation, required to solve critical problems in research and/or innovation and to extend and redefine existing knowledge of professional practice	- demonstrate substantial authority, innovation, autonomy, scholarly and professional integrity and sustained commitment to the development of new ideas or processes at the forefront of work or study contexts including research

* The descriptor for the first cycle in the Framework for Qualifications of the European Higher Education Area agreed by the ministers responsible for higher education at their meeting in Bergen May 2005 in the framework of Bologna process corresponds to the learning outcomes for EQF level 6.

** The descriptor for the second cycle in the Framework for Qualifications of the European Higher Education Area agreed by the ministers responsible for higher education at their meeting in Bergen May 2005 in the framework of Bologna process corresponds to the learning outcomes for EQF level 7.

*** The descriptor for the third cycle in the Framework for Qualifications of the European Higher Education Area agreed by the ministers responsible for higher education at their meeting in Bergen May 2005 in the framework of Bologna process corresponds to the learning outcomes for EQF level 8.

APPENDIX 3. Finnish National Qualification Framework, Doctoral Level

Table 1

The target level, base level, work load, professional qualification and profile of the doctoral degree according to the frame of reference of Finnish university degrees

Base level

Suitable higher university degree, corresponding foreign education or other sufficient readiness acceptable to the university.

Work load

At least 4 years of full-time study, including theoretical studies at graduate level and independent research; the degree includes a publicly defended dissertation.

Professional qualifications

Qualifies for doctoral degree, higher university degree or public office or post requiring a university degree; qualifications for filling a post requiring researcher training.

Profile

Professionally oriented degree.

In addition to the formally required work load, the frame of reference for the degrees should include a set of learning outcomes (Table 2) produced by the degree. These learning outcomes are divided into knowledge (depth and breadth), skills (language and communication skills) and competences (cognitive, working-life related and ethical competences).

Table 2

The learning outcomes and goals of university degrees at the doctoral level according to the Finnish frame of reference

Knowledge (Breadth)

- knowledge that significantly extends the knowledge achieved in the second cycle degree
- extensive knowledge of questions related to at least one discipline and its development, social significance, basic problems and research methods;
- familiarity with the general theory of science and with other disciplines related to the field of research which enable the candidate to follow developments in these fields

Knowledge (Depth)

- knowledge that significantly extends the knowledge achieved in the second cycle degree; excellent knowledge of one's own research area; influencing the development of the discipline through one's own research
- the ability to critically and analytically evaluate the theories and research findings of one's own research area; the ability to form a synthesis of the new findings and complex information of one's own research area
- the knowledge gained after completing the degree is based on scientific research and the latest developments in one's own discipline

Skills (Language and communication skills)

- excellent command of one of the national languages of Finland and sufficient command of the other, as well as good oral and writing skills in at least one foreign language
- a good ability to communicate orally and in writing both with the scientific community and the general public concerning questions in one's own research area
- the IT skills required by working life
- skill in international communication and interaction

Competences (Cognitive competences)

- preparedness to create new scientific knowledge in accordance with scientific good practices; preparedness to develop and apply the scientific research methods of the research area independently, analytically and critically within one's area of research
- in artistic fields preparedness to independently create methods for artistic expression, or to create products or performances fulfilling high artistic requirements
- preparedness for life-long learning

Competences (Competences required by working life)

- preparedness to develop one's own research area or sister disciplines using the scientific foundation of the discipline; preparedness to develop new approaches to questions arising in working life and to solve complex problems even on the basis of incomplete information
- the ability to organize and direct research projects; preparedness to undertake expert and executive tasks requiring scientific know-how
- preparedness to function in an international and national context for the development of the field

Competences (Ethical competences)

- the ability to solve complex problems in accordance with ethical principles

The material can be found at
www.ehea.info/Uploads/Seminars/Helsinki_Invitation.pdf