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Gabriele Gorzka, Ute Lanzendorf (eds.)

## Europeanising Doctoral Studies

### The Russian Federation and Germany on the Way to Bologna

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# Foreword

*Gabriele Gorzka*

Universities in Europe are currently involved in an intensive process of reforming their structures. In addition to changes in study programmes, a special focus is on doctoral studies. They are regarded as an important link between two lines of European activity, namely the Bologna Process which is working towards the European Higher Education Area, and the Lisbon Process which aims at building a European Research and Innovation Area.

Doctoral studies have recently been included in the Bologna Process as a third cycle of study programmes. From the perspective of the Lisbon Process, doctoral education is seen as vital for building a *Europe of Knowledge* which is to represent the strength of Europe in a globalised economy.

In this context, doctoral programmes became relevant instruments to meet the political goals of increasing the quality of researchers to strengthen European competitiveness in research and development, of improving mobility of researchers within Europe, and of installing a process of quality assurance in higher education.

All 45 countries signing the Bologna-Declaration in 1999 are asked to develop basic principles for doctorate programmes till the next conference of Ministers in London 2007. Russia joined the Bologna Process in 2003 and implemented first steps of reforming its higher education and research sectors.

With respect to the European Research and Innovation Area, a recent agreement between the European Union and the Russian Federation enables Russian researchers to participate in EU-supported research projects. This agreement, among others, calls for common projects in the field of training and mobility of researchers.

There is great interest in Russia to share the experiences of the reform process with partners like Germany where study structures in the past were quite

similar. So the organizers of the German-Russian St. Petersburg Dialogue set up a German-Russian Bologna Working Group coordinated by the German Rectors Conference.

One of the instruments to promote the bilateral dialogue was a German-Russian Conference on "Europeanising Doctoral Studies", organised at Kassel University in June 2005.

Political decision makers and university representatives were invited to compare tradition and present situation in the two Bologna countries Russia and Germany. They discussed practical steps to restructure doctoral qualification processes according to the five European issues as they were underlined in Bergen in May 2005, that is:

(1) to structurize doctoral studies and improve quality of postgraduate programmes;
(2) to understand participants in third cycle programmes – following Bachelor and Master Degree – "both as students and early stage researchers";
(3) to concentrate doctoral studies to 3 – 4 years of full time;
(4) to promote interdisciplinary training and develop transferable general skills to meet the needs of the wider employment market;
(5) to increase the number of doctoral candidates taking up research careers.

The papers of the Kassel conference, published in this volume, reflect on the political visions on European national levels, the status quo of doctoral qualification, as well as new initiatives and best practise models in both countries. European standards for doctoral programmes and internationalisation of doctoral studies are further topics of debate.

Seeing Europeanization not only in terms of standardization of national systems or recognition of degrees but in promoting co-operation within Europe the dialogue of the Kassel conference may be a starting point for a regular German-Russian exchange as well as an initiative of bi-national co-operation in the field of doctoral education, taking mobility of young European researchers as a very important aspect and regarding the two countries Germany and Russia as strong partners in the prospective European Research and Innovation Area.

The conference and this publication were organized by two institutions of Kassel University which for years have been engaged in higher education reforms and colaboration with countries in Eastern Europe: the Centre for Research on Higher Education and Work and the East West Science Centre.

The *Centre for Research on Higher Education and Work* was founded in 1978 as an interdisciplinary research unit of the University of Kassel. Rapidly, it established itself as an internationally leading higher education research institute. The Centre aims to contribute both to the theoretical and methodological advancement of research and to the provision of practice-relevant systematic knowledge on higher education. The Centre is particularly active in the field of European research.

Among the major research topics of the Centre figure higher education and the world of work, evaluation processes, internationalisation and globalisation, as well as new governance models for higher education and research.

For years now, the Centre has been working on the reform of study structures in the context of the Bologna process. It has undertaken various national and internationally comparative studies for the German government. The Centre also carried out various studies on the careers of Ph.D. graduates.

The *East West Science Centre* was established in 1992 as a service unit for east-west projects in teaching, research and development. Since 2003 East West Science Centre initiates and supports co-operation of all higher education institutions in Hessen with partners in Central and East Europe.

The East West Science Centre has a specific focus on Russia. Current activities include the running of a German-Russian Science Portal, the coordination of a German Russian Research Network in Biotechnology, the building up of E-Learning Centres at universities in Omsk and Yaroslavl, and the edition of a Russian-German-English glossary on the Bologna Process.

We hope that this report will contribute to the ongoing debate on European reforms in the higher education sector and will give an impulse for intensifying the German-Russian interaction in the field of doctoral programmes.

# Opening Address

*Michael Schlicht*

It is a pleasure for me to speak to you today on behalf of the Federal Ministry for Education and Research (BMBF) at the opening of this conference. First of all, I would like to thank the East-West-Science Centre for their organizational effort. This conference takes place at the right time. The Russian Federation is conducting a lively debate about opening and restructuring the education and research system to strengthen its orientation towards Europe. President Putin and Research Minister Fursenko expect the training and research institutions to show a great deal of flexibility. Some of these institutions have already developed common standards together with European partner institutions – mainly in Germany – and are applying these in joint study courses and research projects. Others are still hesitant about adapting their tried and tested, traditional rules to the new European framework.

Such phenomena are not unknown in Germany and I assume that there will be a productive exchange of views here in Kassel. Our countries have declared their readiness vis-à-vis the EU to adapt their national systems to the Bologna and Lisbon Processes. Our Education and Research Ministers discussed this point at the Conference in Bergen/Norway. We must now try to find suitable ways to develop new identities in Europe without abandoning our traditional identities.

The topic of doctoral studies is a link between the European Higher Education Area and the European Research and Innovation Area. As you will know, the Ministers' Conference in Bergen decided to include doctoral studies as the third cycle in the Bologna Process beside Bachelor and Master programmes. By the way, this decision was prepared by the Ministers at their Conference in Berlin in September 2003. The expansion of the process is to interlink the European Higher Education Area and the European Research Area. Doctoral studies are an

important link in this context. As only the universities have the right to award doctoral degrees, the BMBF attaches special importance to ensuring that the universities and their representations develop their own proposals. The Bologna Follow-up Group, in which our two countries are represented, shares this view. The Group has therefore asked the European University Association together with other interested partners to draw up a report on the further development of the basic principles of doctoral programmes under the direction of the Follow-up Group. At the same time, efforts should be made to avoid any overregulation of doctoral studies.

Against this background, I am pleased to note that so many representatives of universities in our countries have come here to discuss the impact of EU policy on scientific practice. Some of you took part in the international conference on doctoral studies in Salzburg in February 2005, which the German Federal Ministry for Education and Research organized jointly with the Austrian Ministry of Education, Science and Culture and the European University Association.

A bridge between the European Higher Education Area and the European Research Area has been built on the basis of the recommendations of the European Commission for a European Charter for Researchers and a Code of Conduct for the Recruitment of Researchers, which were adopted by the Competitiveness Council on 18 April 2005. The European Charter for Researchers is a set of general principles and requirements which specifies the roles, responsibilities and entitlements of researchers as well as of employers and founders of researchers. The aim of the Charter is to ensure that the nature of the relationship between researchers and employers or founders is conductive to successful performance in generating, transferring, sharing and disseminating knowledge and technological development, and to the career development of the researchers. The Charter also recognizes the value of all forms of mobility as a means for enhancing the professional development of researchers. A standardized profession of researcher with different career paths is to be developed within the European Research Area. Only in this way can the considerable differences between the more than 40 countries participating in the Bologna Process be taken into account. In addition there are different definitions and responsibilities at local and regional level within the countries concerned. And finally, recruitment procedures are often not transparent and comparable, which is another considerable obstacle to mobility. The European Commission therefore recommends that

Member States endeavour to take, wherever necessary, the crucial steps to ensure that employers or founders of researchers improve the recruitment methods and career appraisal systems in order to create a more transparent, open, equal and internationally accepted system of recruitment and career development as a prerequisite for a genuine European labour market for researchers. Furthermore it recommends that Member States – as they formulate and adopt their strategies and systems for developing sustainable careers for researchers – take duly into account and are guided by the general principles and requirements, referred to as the European Charter for Researchers and the Code of Conduct for the Recruitment of Researchers outlined in the Annex to the mentioned recommendations.

The European Commission expects that the definition of general principles and requirements in a European Charter and Code of Conduct will result in considerable improvements, which, among other things, should increase the number of researchers in the EU and bring it closer to the number of researchers in Japan and the USA as a percentage of the population. Now that these recommendations have been adopted by the European Commission, the Member States are requested to meet the requirements in defining their national strategies, set up control mechanisms and inform the Commission about the measures taken to implement the recommendations.

The German Parliament's Committee on Education and Research dealt with this topic in early June. Without doubt, Europe needs considerably more researchers – not only to play a leading role in science and research in future global competition but also to create sustainable, competitive jobs which secure prosperity. Germany therefore welcomes the Commission's initiative to promote the development of human resources in the European Research Area together with the Member States. Integrating the different aspects of human resources in a common strategy would seem to be a particularly promising approach. Our federal system and the autonomy of German universities and social partners are special features which may cause problems in the implementation of the recommendations. But as the recommendations are based on the principle of subsidiarity and voluntary action, it can be hoped that Germany will also make a substantial contribution to the implementation of the EU Charter.

Let me conclude by addressing a special aspect of our national policy. We are currently trying to introduce structured doctoral studies at universities in Germany in keeping with European developments. The BMBF is providing funding

for a programme which is being carried out jointly by the German Research Association (DFG) and the German Academic Exchange Service (DAAD). No doubt, our experts will come back to this point during the conference. Our programme called PHD (which stands for "Doctoral studies at German universities") opens up excellent opportunities for foreign students in particular; in my view, it is an interesting approach towards internationalizing doctoral studies in Germany.

The Commission hopes that concrete steps will soon be made to implement the Charter in the associated countries. These countries are requested to report on the measures they have taken to implement the recommendation and on initial results, and to present examples of best practice for the first time in December 2005 and then at annual intervals. Furthermore, the Education and Research Ministers of the European Union have requested that progress reports on the award and recognition of joint degrees, including doctoral degrees, be submitted for their next Bologna Follow-up Conference which will be held in London in May 2007. I hope, and I am sure that today's conference will make further substantial contributions to these processes.

Thank you.

# I
# The Political Vision of Doctoral Studies

# The European Vision - Doctoral Studies as a Link between the European Higher Education Area and the European Research and Innovation Area

*Ute Lanzendorf*

At the Bologna Follow-up Conference in Berlin in 2003, an Action Line entitled "European Higher Education Area and European Research Area – two pillars of the knowledge based society" was added to the Bologna Process. Doctoral education plays a key role in the context of this Action Line. It became to be regarded as the third cycle within a common European structure of study programmes to be realized until 2010. The subsequent Bologna Seminar in Salzburg on "Doctoral Programmes for the European Knowledge Society" and the Follow-up Conference of the Bologna Process in Bergen 2005 therefore took up the issue of doctoral education in depth.

This section presents the key results of the Bologna Seminar in Salzburg and the Bergen conference, drawing on official texts published on the internet.

## Bologna Seminar on "Doctoral Programmes for the European Knowledge Society"

From the discussions in Salzburg in February 2005, a consensus emerged on a set of ten basic principles:

(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 recognized 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 colaboration between universities.

(7) Duration: doctoral programmes should operate within an 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 intersectoral 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.

## Conference of European Ministers Responsible for Higher Education, Bergen, 19-20 May 2005

At the Bologna Follow-up Conference in Bergen, one session was dedicated specifically to doctoral education. Its results were summarized by Sybille Reichert as documented below. Following the report of Sybille Reichert, those parts of the Bergen Communiqué referring to doctoral education will be quoted. [1]

In emphasising the doctoral level as the third cycle in the Bologna Process, the Ministers have underlined in Berlin in 2003 and emphasised again in Bergen in 2005 the importance of research and research training for the quality of higher education.

Looking at recent debates, the discussion group realised that, across Europe and indeed also in North America, there is a wide agreement on the values that should underpin doctoral training, namely that doctoral training should serve the advancement of knowledge through original research, should be based on academic freedom and, increasingly, that it would be desirable that such research would contribute, in the long term, to the economic and social advancement of humanity.

Moreover, it seems that higher education representatives and policy makers also agree on the problems which deserve concentrated attention:

- First and foremost, the quality of the mentoring which doctoral advisors offer their candidates should be looked at, fostered and assured more systematically.
- Secondly, doctoral training should be embedded in institutional strategies and structures (such as graduate schools) so as to benefit from synergies with research strengths, integration into larger interdisciplinary contexts, offering also supplementary training perspectives and better social integration for doctoral candidates.
- Thirdly and linked to the previous point, more attention should be paid to the social and interdisciplinary integration of doctoral candidates so as to prepare them for highly networked working life.

[1] Results of the Parallel Session on Doctoral Training and the Synergy between Higher Education and Research. Rapporteur: Dr. Sybille Reichert. http://www.dfes.gov.uk/bologna/index.cfm?fuseaction=docs.list.

- Fourthly, not enough attention has been given to career development and preparation of doctoral candidates for non-academic labour markets into which a majority of doctoral graduates are to be inserted later.
- Last not least, not enough money is being spent to allow for adequate fellowships, scientific equipment, and time for mentoring to support full time doctoral training in research environments of competitive scientific standards. It should be fully recognised that doctoral candidates are not just more advanced students in the traditional sense but should be recognised and treated as early stage researchers, i.e. professionals who would have received a full salary had they entered the non-academic job market immediately upon graduation from the Masters' programmes.

To address some of these concerns, guidelines have been defined and implemented in various national contexts (e.g. the UK) but also at European level where the existing consensus on quality standards for research training have been laid down in the European Charter for Researchers and the European Code of Conduct for the Recruitment of Researchers which were presented by Sigi Gruber from the European Commission (DG Research), as well as in the Salzburg Recommendations on Doctoral Training which were formulated last year. In addition to the concerns mentioned above, such as the need to improve the quality of mentoring, the Salzburg Recommendations also pointed to the need for achieving critical mass, for promoting innovative structures and for offering appropriate funding so as to offer attractive research environments for doctoral candidates. Mobility should also be an integrated feature of doctoral training, both European recommendations (the Charter and the Salzburg recommendations) emphasize.

As Debra Stewart's presentation showed, we can also learn from good practice of doctoral training in the US where especially the synergy between doctoral education and research, the active internationally visible graduate schools of research universities but also the quality of mentoring with established graduate "Plan of Study" templates are worth mentioning. Also the diverse and competitive funding sources help the strong institutions acquire an adequate funding base for their doctoral training, which, it should be noted, involve significantly higher expenditure per doctoral candidate than is the norm at European universities. Finally there is a regular assessment of the quality of all doctoral programmes which can then be more easily compared. All this happens against a backdrop of

wide institutional autonomy and a higher mix of private funding (including tuition fees and endowment income) than is the case for competing European universities.

Given the wide degree of agreement on values and problems to be addressed, the discussion group came to the conclusion that it is now time to act. First of all, this should involve follow-up on how the European Charter for Researchers and the Salzburg Recommendations are being implemented at national and institutional level: Here the European Commission and the EUA should play a significant role of orchestration. In this respect, the Bologna Process may serve as example of a success story in that peer pressures between national level actors can be said to have contributed significantly to swifter more targeted action.

Last not least, it was emphasized that there are also significant challenges to be addressed, in particular concerning the possible tension between internationally competitive research and the important role of research for regional development. On the one hand policy makers have to become more aware that fierce international competition among research institutions obviously calls for creating critical mass in given research areas, for concentrating excellence at fewer institutions which would be able to offer a wider range of disciplines with enhanced interfaces between them, with competitive and therefore costly conditions, under scrutiny of highest performance. On the other hand, policy makers have to do justice to the importance of university research as a motor for regional development. For both potentially conflicting aims, different instruments may be advisable and should coexist without undermining each other. Indeed, more comparisons are needed of how different nations and regions address this tension in order to make recommendations of how to design such complementary instruments in order to do justice to both concerns, at national and regional but also at European level. To conclude, the group urged policy makers to proceed with extreme caution given the harm that can be done to both aims if one serves the one without caring for the other.

## Extracts from the Bergen Communiqué "The European Higher Education Area – Achieving the Goals" referring to doctoral education[2]

"The European Higher Education Area is structured around three cycles, where each level has the function of preparing the student for the labour market, for further competence building and for active citizenship. The overarching framework for qualifications, the agreed set of European standards and guidelines for quality assurance and the recognition of degrees and periods of study are also key characteristics of the structure of the EHEA."

"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 emphasise the importance of research and research training in maintaining and improving the quality of and enhancing the competitiveness and attractiveness of the EHEA. With a view to achieving better results we recognise the need to improve the synergy between the higher education sector and other research sectors throughout our respective countries and between the EHEA and the European Research Area.

To achieve these objectives, doctoral level qualifications need to be fully aligned with the EHEA overarching framework for qualifications using the outcomes-based approach. 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. We need to achieve an overall increase in the numbers of doctoral candidates taking up research careers within the EHEA. We consider participants in third cycle programmes both as students and as early stage researchers. We charge the Bo-

[2] http://www.dfes.gov.uk/bologna/uploads/documents/050520_Bergen_Communique.pdf, p. 6.

logna Follow-up Group with inviting the European University Association, together with other interested partners, to prepare a report under the responsibility of the Follow-up Group on the further development of the basic principles for doctoral programmes, to be presented to Ministers in 2007. Overregulation of doctoral programmes must be avoided."[3]

[3] http://www.dfes.gov.uk/bologna/uploads/documents/050520_Bergen_Communique.pdf, p. 4 – 5.

# Future Challenges for Doctoral Studies in Germany

*Ulrich Teichler*

## Introduction

For many years, the process of teaching, learning and working at the stage from a regular university degree up to the award of the doctorate was a step-child in higher education and research policies both on European level and in Germany. Issues of investment in higher education, curriculum development, improvement of teaching and learning etc. were high on the agenda in most countries with respect to the first-degree programmes. Also, the financial promotion of student mobility and efforts to facilitate student mobility on European level hardly addressed the doctoral candidates. On the other hand, doctoral study and doctoral work never were seen as well as one of the central themes of research policies.

This does not mean that qualifying for the doctorate tended to be viewed as irrelevant. Awarding the Doctor title is the most visible privilege of universities in many countries of the world. Rather, the future of the doctorate probably was not a key issue in higher education and research debates because there was a lack of any convincing vision about the future of the doctorate.

In recent years, the sense of urgency has grown. Something should be done for the future enhancement of the doctorate, because it is viewed to be more relevant on the way towards a "knowledge society" and a "knowledge economy". We note on the one hand, that the ministers in charge of higher education have pointed out in the Berlin 2003 and the Bergen 2005 Conferences of the Bologna Process to pay more attention to doctoral study as the third level of education. On the other hand, the European Commission pointed out in April 2005 that among efforts to promote a European Research Area in the Framework of the so-called Lisbon Strategy: "A main priority will be postgraduate/doctoral

schools and networks of European and worldwide calibre, in their dual function as the peak of higher education and the first career stage for researchers".[1]

This notwithstanding, the current debates only suggest that the questions are clearer which need to be responded. But questions still lack convincing responses. Also, the actual developments of doctoral study and work in Europe are so diverse[2] that major coherent common trends are lacking in many respects.

Therefore, this contribution does not aim to identify major trends. Rather, a short explanation will be provided each for the ten major issues which seem to be at stake according to the current debates both in Germany and across Europe.

## Expansion

In various European countries, more than half of the corresponding age group take up study in tertiary education. In some countries, for example in Finland and Norway, tertiary education seems to become an entry qualification for all occupations except for manual labour and simple routine service functions. In the mean time, more than a quarter of the age group are awarded a higher education degree of at least a Bachelor level in several European countries, and in some countries we expect an increase of the ratio of Bachelor awards to about half of the age group in the near future.

With respect of doctoral awards, however, we note that, until recently, less than one percent of the corresponding age group eventually reached this prestigious credential in most European countries. Trends and policies varied. In Germany, for example, we noted a relatively stable trend of expansion of doctorates along the overall expansion of higher education; we observed also a relatively stable pattern that one seventh of university graduates eventually were awarded a doctoral degree. In other countries, the number of doctorates grew to a lesser extent for some years. Finally, in other countries, efforts were made in the 1980s and 1990s to promote an increase of doctoral awards beyond that in first degree programmes. Currently, we observe a stronger consensus among relevant actors and experts that a further increase of doctorates is needed across Europe.

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[1] Commission of the European Communities, 2005, p. 11.

[2] See Enders and de Weert, 2004; Sadlak, 2004; Kehm, 2004.

One could ask, however, whether efforts for an increase should be more or less similar across Europe or whether one should strive for a quantitative convergence in Europe. For example, the doctoral award quota in Germany is almost two percent of the respective age group and is almost twice as high as the European average. Should Germany put its major efforts into the increase of Bachelor studies while keeping the doctorate more or less on the same level in the near future, or should one try to expand doctoral study and work at a similar pace as in other European countries?

In discussing the future quantitative figures of doctorates, one tends to refer to the corresponding developments of research and senior academic positions in universities because these are traditionally and still today the major fields of employment of doctorate recipients.[3] Available statistics show that about 1.5 percent of all employed persons in the European Union work as research and development personnel.[4] Most experts predict that this proportion is bound to increase substantially over the years.

One should bear in mind, however, that countries vary substantially in the extent to which the R&D personnel are holders of doctoral degrees. Customs vary between countries and disciplines as regards to which a Doctor degree is more or less an indispensable prerequisite for regular research and development positions. Also, the role of doctoral degrees differs substantially with respect to senior teaching positions in other non-university higher education institutions, i.e. institutions not granting doctoral degrees. In Germany, a Doctor degree and five years of subsequent academic and other professional activity are the entry qualification for a professoriate at the Fachhochschule (university of applied sciences), while in most other countries a doctorate is not the required entry qualification for a similar type of higher education institution.[5]

More importantly, an increasing proportion of persons awarded a doctoral degree turn to professional activities outside research institutions and outside teaching and research in higher education. What might have been viewed in the past predominantly as inappropriate employment is – on the way towards the "knowledge society" – a normal and widespread career option. For example, the results of a survey undertaken in Germany on the careers of persons holding a

[3] See Recotillet, 2003.

[4] EUROSTAT, 2005, p. 26.

[5] See Enders and Teichler, 1995.

Doctor degree suggest that those ending up outside research and higher education view the use of knowledge acquired and state their job satisfaction on average only moderately lower than those ending up in research or other academic careers.[6]

## Composition by Disciplines

Without going into details, we can summarize available statistics in arguing that, in the majority of marked-oriented economically advanced countries over the most recent few decades,

- about half of the graduates from universities and other institutions of higher education were awarded degrees in natural science and engineering fields,
- about three quarters of the Doctor degrees were awarded in natural science and engineering disciplines, and
- about 85 percent or even more of research promotion budgets were allocated to natural science and engineering.

This notwithstanding, debates about the future needs of an increasing number of doctorates seem to suggest that the demand will be high for doctorates in the domain of natural science and engineering. In this framework, the term "knowledge economy" is widely employed in order to underscore that the future of the economy will depend largely on innovation in science and technology. A closer look, however, shows the ambiguity of these debates. Is there a concern that the proportion of graduates in these domains might fall behind? Or is there a need felt to increase this proportion?

## Structured Doctoral Programmes

In many European countries, structured doctoral programmes have spread since the 1980s. There is a widespread view that the impressive research advancements

[6] Enders and Bornmann, 2001.

in the United States can be attributed to a substantial extent to the fact that the U.S. universities had substituted the European "apprentice" model of doctoral training by a "graduate school" model.[7] Also, U.S. graduate schools became the most attractive place for doctoral candidates all over the world: even U.S. universities without a high research reputation are popular among doctoral candidates all over the world because they can be more certain to be supported systematically by the university and their professors on the way towards the doctorate. The graduate school model differs from that of an apprenticeship notably in two respects:

- a collective responsibility of the university for doctoral candidates, through special organisational units but also through involvement of various persons in advice and supervision of the individual doctoral candidates instead of the supervision and advice predominantly by a single professor;
- structured elements of teaching and learning, for example taught courses for doctoral candidates instead of almost exclusive work on the doctoral thesis.

However, most doctoral programmes established in European countries within a few decades do not go as far as the U.S. graduate schools, as far as institutionalisation, collective responsibilities, taught courses and detailed supervision is concerned. For example, the German pilot programme of "Graduiertenkolleg" established in the early 1990s differed substantially from the U.S. graduate school. Public financial support was granted to groups of professors and in a similar way to research projects undertaken by researchers cooperating merely for the purpose of a joint project without any long-term institutional basis. Financial support was guaranteed only for short periods of two or three years with possible extension – again a financial model suitable for research promotion instead of stimulating institutionalisation. Emphasis was placed in the initial Graduiertenkollegs on interdisciplinarity rather than on support of the main streams of research, and in spite of this, hope was flying high that the process of doctoral work would become speedier than before.

Up to the present, it is difficult to say whether the more modest steps towards structured programmes in most European countries are just hesitant compromises between the U.S. model of graduate schools and the European past of individual supervision, or whether various of the European options could be viewed as

[7] Clark, 1995.

superior to a graduate school model. Is it wise to move in Europe towards a diversity of options, or towards a convergent model, and how would such a convergent model look like?

## Dispersed Options or Concentration

More or less all proper European universities were entitled in the past to award doctoral degrees, and nobody considered it problematic in principle if there was just one new Doctor in history or one Doctor in political science in a given year at a given university. A high degree of consensus in the academic community about the desired character of doctoral theses as well as close communication between the professors and their doctoral candidates were supposed to ensure the same level of quality in such a singular process of learning and work towards the doctorate as in universities where several doctoral candidates within a field of study interacted with professors and fellow doctoral candidates.

The establishment of graduate schools or other kinds of structured doctoral programmes is necessarily linked to a concentration of substantial numbers of doctoral candidates in a smaller number of select universities and possibly select fields within these universities. In some countries, such a concentration is often undertaken to a somewhat lesser extent through joint doctoral programmes in a given discipline across various universities.

What degree of concentration should be strived for in the future? Should universities only be entitled to award doctoral degrees in those fields where certain structured elements of doctoral training are in place?

## Links between Master and Doctor Programmes?

In the past, most continental European countries viewed their university degrees as equivalent to a Master degree both in comparison to the United States and to England. Since the late 1990s, however, activities are underway all over Europe to establish a convergent system of levels of study programmes and degrees.

From the perspective of continental European universities, one of the main tasks of reforms in the so-called Bologna Process is to establish a Bachelor degree as a lower-level "exit" from study, while the quality and the character of study at a university up to a Master is not necessarily different substantially from study towards a first university degree in the past.

In the United States, however, the major divide within universities, tends to be between "undergraduate education" up to a Bachelor level on the one hand, and "graduate education", comprising both Master and similar professional studies as well as doctoral studies on the other hand. For the European universities, it seems to be more natural to keep a close tie between Bachelor and Master programmes. Also, neither the Master programmes in the United States nor in Europe can be understood as highly selective programmes already preparing predominantly the entry to academic careers. This notwithstanding, some actors and experts suggest that European countries should move towards a similar divide between undergraduate education and graduate education as prevailing in the United States.

## Quality

Experts tend to agree that views about the expected quality of a doctorate differ to a lesser extent all over the world than views about the expected quality of first-degree programmes in higher education. Consequently, when I was invited to participate in the assessment of doctoral dissertations in various countries of the first world, I never saw the need of reading any instructions about the aims and regulations of doctoral study in the respective country or university, but I just read the dissertations in the other countries like a dissertation in my own country and assessed them in a similar way.

However, there are some noteworthy differences. In Japan, a doctoral dissertation in the humanities and social sciences traditions was more similar to "Habilitation" or a second-level Doctor ("doctor scientiae" or similarly) in European countries. On the other hand, the U.S. Doctor is widely viewed in Europe as slightly less ambitious than the European Doctor. Suggestions in Europe to introduce graduate programmes similar to the U.S. often were advocated in the

past with the argument that one could set somewhat reduced levels of expectations as regards to the workload needed to write a dissertation.

Of course, most rhetoric in higher education and research sounds as if any suggestion for reform has an enhancement of quality in mind. However, a close look reveals that often efficiency is the aim in terms of keeping or moderately lowing quality with substantial less investment of time and money. So, it remains an open question whether the quantitative expansion of doctorates is really expected to be achieved on the same level or even an enhanced level, or what degree of lowering of quality among the increasing numbers of doctorates is viewed as acceptable.

## Enhancement of Competences beyond Research

Learning to conduct research and practising a first almost independent step of research is the main task of the doctoral candidates. And a person being awarded a doctoral degree is only certified to be a highly qualified researcher. In recent years, however, proposals gained popularity to take care of fostering a somewhat broader spectrum of competences during the period of doctoral training and learning.

Persons doing research are more often required these days than in the past to co-operate with other researchers in teams, to take over administrative tasks associated to the research process, to prepare themselves systematically for teaching tasks and to qualify for demanding and complex future tasks in terms of problem-solving abilities, work attitudes, professional ethics, socio-communicative skills etc.

Training for such skills might be on-the-job training in research teams and in concurrently teaching or administrative assignments. But it also might take place through systematic instruction, supervised practice or other means. Graduate programmes might be in a better position of enhancing a broader range of competences in a targeted manner than individualized supervision, but up to now it had remained in most countries an open question which of such competences should be fostered and what the best possible means are.

## The Status of Doctoral Candidates

As in recent years emphasis has been placed on the virtues of establishing doctoral programmes, the view has spread that the majority of doctoral candidates in Europe are doctoral students, i.e. persons not employed, but self-funding supported by scholarships for focussing their activities on preparing and writing a dissertation. Although no perfect statistics are available, it was justified in the past to estimate that the majority of doctoral candidates in Europe did not have the major status of "doctoral students", but were employed as researchers, teachers and practitioners, whereby they could qualify for the doctorate as part of official assignment or they work on their thesis outside their prime assignment.

Usually, however, little information is available in each country about the major modes of funding the doctoral phase. A study of Germans awarded a doctoral degree in the 1980s in select years and fields,[8] for example, suggests that more than 10 percent each of Doctor degree holders had been during their period of doctoral study and work

- employed on regular staff positions in universities,
- employed on regular staff positions in research institutions,
- employed on research contract funds,
- awarded a public doctoral fellowship,
- awarded another doctoral fellowship,
- employed outside higher education and research,
- funded by their parents, their partner, their own saving etc.

The more a need is felt to expand the number of doctorates, the more efforts are made in various countries to move towards a certain "king's road" to the doctorate. Some observers consider the views expressed by the ministers during the 2003 Berlin and 2005 Bergen Conferences as indications that the model of the doctoral student is the preferred one, but a close look reveals that the realities and concepts still vary substantially across Europe. On the basis of a recent comparative study, however, Enders and de Weert[9] argue that the student status of doctoral candidates is most frequent across Europe nowadays. In Norway, Sweden und the Netherlands, schemes are realized ensuring a substantial number of

[8] See Enders and Bornmann, 2001, pp. 51-53.

[9] See Enders and de Weert, 2004, p. 23.

doctoral candidates various privileges of employment while allowing them to spend all their time on doctoral work, but this does not seem to be on the way of becoming the general model across Europe.

So, the debate is likely to go on about the desirable status of doctoral candidates. Funding issues will remain controversial because of financial constraints, possibly needs to make doctoral study and work attractive, diverse views about desirable social and organisational conditions for doctoral study and work as well as because of controversial perceptions of the research value of doctoral dissertations.

## Funding of Doctoral Study and Work

As already pointed out, the decisions about the normal status of a doctoral candidate – whether he or she is in the majority of cases a doctoral student, an employed researcher or a mix with the freedom of a doctoral student and some privileges of an employee – is linked to the question how the period of training, work and learning for a doctoral degree is funded. Three arguments are most frequently put forward for a better funding of the doctoral candidate:

- The quality of the doctoral dissertation is likely to improve if the doctoral candidates can focus on it without other duties and without concerns about their living conditions.
- If funding of the doctoral candidates is limited, many persons talented for good research will opt for other careers.
- A good funding of doctoral candidates is needed amidst growing global competition in order to keep or to win the most talented candidates for one's university, research institution, R&D unit or country.

The enthusiasm for better funding of doctoral candidates actually is often quite limited in spite of these arguments. There are certainly, though less vocal, views widespread according to which less financial support on average for doctoral students would be normal under conditions of substantial increase of the number of doctoral candidates, of a growing proportion of persons holding a doctor eventually getting employed outside higher education and research. Moreover, limited funding seems to be justified, if the work on dissertation is predominantly

viewed as learning rather than a productive phase of life and if one expects that doctoral students could invest in this phase of life, because they are likely to be financially rewarded in their subsequent career.

Up to the present, we do not note any dominant, convergent policy emerging across European countries in this respect. We should not be surprised to find that in spite of the frequent debates about the most promising funding models, the actual modes of funding will remain as least as diverse as they had been in the past.

## International Mobility of Doctoral Candidates

Finally, decisions have to be taken by the various European countries as regards the extent to which international mobility of doctoral candidates should be promoted. In many European countries, stronger efforts had been made for long periods to promote mobility of doctoral candidates than to promote mobility of students in earlier stages of learning. It is generally assumed that in-depth acquisition of knowledge from all over the world is more important for doctoral study than for all prior processes of learning. In the U.S., the major host country of mobile students, the proportion of foreign students in doctoral programmes consistently was four times as high or even higher than the proportion of foreign students among those enrolled in Bachelor programmes.[10] Last not least, most developing countries have built up their higher education system to a level where Bachelor study might be taken in the home country as a rule, but postgraduate study abroad is advisable for the future scholars.

But a substantial increase of doctoral study abroad was not on the agenda in Europe for a long time. Among others, it is more costly than the support of doctoral study at home. While ERASMUS students, mostly first-degree students and now increasingly second-degree Master students mostly get only about 1,000 EURO to cover some of the additional costs for a short period abroad, the European Commission provides on average more than 50,000 EURO for Marie-Curie doctoral candidates to cover living costs, mobility costs and research funds for the hosting institution.

[10] OECD, 2004.

More recently, concerns about brain-drain have increased. The more international mobility and global cooperation is facilitated, the more grew concerns about unfavourable global competition as well. Figures such as those showing that about 10 percent of all Bachelors, about 20 percent of all Masters and more than a quarter of all doctors among scientists and engineers in the U.S are foreign-born[11] tend to be referred to in order to underscore the danger of brain-drain. Though Europe is often advocated as an area of cooperation, concerns about a brain-drain from the poorer to the richer countries of Europe are by no means expressed less vocally – again for example in the context of the Marie Curie Programme.[12]

It will be interesting to note what kind of mix of internationalisation and nationalisation policies will emerge with regard to the doctoral candidates in the various European countries. Again, we do not yet note any dominant policies.

## Conclusion

In some domains of higher education policy, we note similar trends across Europe and within most European countries. Measures to promote short-term mobility of first-degree and possibly second-degree Master students are widely hailed. Also, joint efforts are on the agenda to establish convergent patterns of study programmes and degrees in terms of a Bachelor-Master level model.

In contrast, the doctoral level of training, learning and work has been a step-child of national policies in many countries as well as of European policies until recently. In recent years, a sense of urgency emerged as far as expansion, institutionalisation and financial support for doctoral study are concerned.

Obviously, however, there is less of a common vision about the future of doctoral training and work in Europe than on many other issues. This might be viewed as a missed opportunity. In contrast, one might argue that there is still room to find imaginative options.

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[11] See OECD, 2004, p. 280.

[12] See Van de Sande et al., 2005.

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# Today's Higher Education in Russia: The State of the Art and Some Modern Tendencies

*Vadim B. Kasevich*

## The Scope of the Educational System and its General Structure

At present, the country has about 700 public higher education institutions, all of these having state accreditation. Besides, more than 600 non-governmental higher education institutions have been licensed for educational activities. Thus, the number of higher education institutions is around 1,300, about 1,200 of these being accredited ones (HEI's branches and affiliates are not included in these statistics). The total number of students of higher education institutions is nearly 6 million.

In Russia, one could speak of a "double-binary" educational system. On the one hand, there are university- and non-university subsystems. On the other hand, there are no-tier- and multi-tier patterns of professional higher education. The latter has been introduced by the Decree of the Committee for Higher Education of the Ministry of Science, 13 March 1992 (no. 13), "On the Introduction of a Multi-level Structure of Higher Education in the Russian Federation". According to it, the Bachelor-level degree is the basis for higher education implying its possible continuation at the Master's programme level. At the same time, the "old" no-tier system was also retained and is prevailing up to this day.

The Government Decree "On the Adoption of the National Standards of Professional Higher Education" of 12 August 1994 (no. 940) specified the structure of professional higher education, viz Professional ("Specialist's") Diploma (5 years), Bachelor's degree (4 years), and Master's degree (6 years,

including the 4 years of Bachelor's degree). The Federal Law "On Higher and Postgraduate Professional Education", 22 August 1996, no. 125-FZ) legally mandated the three kinds of professional higher education programmes, viz Bachelor's, Specialist's, and Master's.

At present, suggestions concerning the amendments to the laws "On Education" and "On Higher and Postgraduate Professional Education" have been submitted for the legislators' consideration. The amendments include

- the nearly universal establishment of a two-tier system of higher education, viz either Bachelor's degree (3 to 4 years) and Master's degree (2 years) or Specialist's diploma on the basis of Bachelor's degree (1 to 2 years);
- creating favourable conditions for continuous education (lifelong learning);
- further expansion of the autonomy of higher education institutions (universities);
- further integration of education and research.

Besides, suggestions have been prepared concerning changes and additions to the legal acts on delegating the right to participate in working out standards of the competence for graduates of various educational programmes to representatives of employers' unions.

*Aspirantura* (post-graduate studies) is a traditional 3 years' programme at HE institutions and research organisations, leading to the degree of *Kandidat Nauk* ('candidate of sciences/arts', approximately equivalent to the Ph.D. degree). It has not been subject to modifications within the Bologna Process in Russia. Formally, *aspirantura* is not regarded as the third HE level. The latest legal acts regulating *Kandidat Nauk* training are the Federal Law "On Higher and Post-graduate Professional Education" of 29 July 1996 (no. 125-FZ) and the "Regulations on Training Research and Pedagogical Personnel in Professional HE in the Russian Federation" of 27 March 1998 (no. 581), adopted by the Ministerial Decree. The *Kandidat Nauk* programmes include compulsory theoretical courses taught in accordance with a Ph.D. student's individual curriculum. These courses include foreign languages (Russian for foreign students), philosophy, and special disciplines, each of these culminating in a State exam. Theoretical courses cover approximately 20 per cent of the programme, the rest of it being devoted to research. Eligible for *Kandidat Nauk* programmes are holders of Specialist's diploma and of Master's degree.

Officially, Bachelor's degree holders are also eligible, provided they pass the entrance exams.

## The Governance in Higher Education of Russia

The highest central authority responsible for education in the Russian Federation rests with the Ministry. According to the decree of the Government of the Russian Federation of 6 April 2004 (no. 158), the Ministry of Education and Science of the Russian Federation has functions connected with the development of the national policies and legislative regulation in the realm of education, research, technology and innovations. Besides, the function of the Ministry is to control and coordinate the activities of its subordinate Federal Agency for Education and Research Supervision and the Federal Agency for Education.

The Government's decrees of 6 April 2004 (nos. 159 and 168) have defined the functions of the Federal Agency for Education and Research Supervision and the Federal Agency for Education. The Federal Agency for Education and Research Supervision within its specified sphere is responsible for

- control and supervision of legislative execution in the realm of education, research and technology, youth policies, and evaluation of research and teaching personnel;
- licensing, certification, and national accreditation of educational institutions and their branches, as well as research organisations in the sphere of post-doctoral and post-diploma professional education;
- confirmation, recognition, and establishing the equivalence of the certificates of education and degrees received in and outside the Russian Federation;
- granting the titles and positions of Professor and *Docent* (Associate Professor), as well as deprivation and restoration of these, granting of the degrees of Candidate and Doctor, and issuing diplomas of the governmental standard;
- organisation and qualification assessment of councils for the defence of dissertations for the degree of Candidate and Doctor (so called dissertation councils).

The Federal Agency for Education is responsible for the administration of educational activities of the institutions for general, specialised and post-diploma professional education in the sphere of national educational services.

Beside this, the system of institutional hierarchy of the governmental institutions of higher education has been retained, the Ministry of Education and Science (Federal Agency for Education) being the founder of 336 higher education institutions, Ministry of Agriculture, 59 institutions, Ministry of Culture, 57 institutions, Ministry of Defence, 51 institutions, Ministry of Health, 48 institutions, Ministry of Interior, 27 institutions, and Ministry of Roads and Routes, 10 educational institutions. Thirty other ministries and agencies (federal executive bodies) are the founders of the rest of the governmental institutions of higher education.

The control of teaching methods used by the higher education institutions of the Russian Federation (both governmental and non-governmental) is the prerogative of the Ministry of Education and Science. It follows that the regulations issued by it apply as well to all the non-governmental institutions of higher education.

## The Quality Assurance System

Until recently (prior to April 2004), the Ministry of Education of the Russian Federation was the governmental body responsible for education quality assurance and evaluation. Nowadays, this function has been relegated to the Federal Service for Supervision in Education and Research (see Decree of the Government of the Russian Federation, 6 April 2004; no. 159). The aforementioned body is entitled

- to receive and consider HE institutions' applications for licensing and accreditation;
- to coordinate and carry out evaluation of the quality of educational programmes and the work of HE Institutions;
- to issue licenses and certificates of accreditation.

The procedure of national quality evaluation includes self-evaluation and report carried out by universities prior to (external) peer evaluation (see Decree of the

Ministry of Education of 29 June 2000, no. 1965). At present, quality assurance programmes based on the international ISO 9000:2000 standards are being introduced. In October 2004, training of experts for quality assurance programmes for HE institutions began.

The problem of quality assurance seems to deserve a special discussion. For many European countries, the Bologna recommended multi-tier educational system is a new one and an implementation of this system is a very serious reform of the existing higher education. It is important to understand that the BA-MA system presupposes a profound rethinking of the educational system. The three to four year long period of study which is going to be introduced instead of 5-year programmes, more traditional for a number of countries, is not merely a matter of arithmetic. The new type programmes should be construed first of all as a response to the challenge of the *massification* of higher education. Obviously, the mass education cannot follow the older restricted model. It should provide learners with a basic foundation making it possible for them to continue their studies, largely in an autonomous regime.

Even the first cycle programmes cannot and should not be oversimplified, nor should they avoid serious theoretical problems. Some educationists hold an opinion that such problems should not be tackled until the next cycle, that is until Master's level. Yet it could be argued that the most natural and productive way of developing *creative thinking* in learners is their participation in research where they are normally supposed to tackle theoretical problems. In other words, creative problem-solving, certainly indispensable for all sorts of tasks, both theoretical and practical, is the most natural way to make students be capable of both continuing their studies at a higher level and entering the job market. The earlier learners begin to enhance their creative thinking, the better. If postponed to a later stage (e.g. to the Master-level period of study), students' research and other creative activities, the potential for such activities may simply "wither". The famous Humboldtian principle of inseparability of education from research is applicable to all cycles of higher education.

It must follow from the above that the competence planned as the set of learning outcomes of the Bachelor-level programmes is not a lower-level competence (as compared e.g. to the output of the more traditional 5-year programmes): it is, rather, some *other* type of competence. This means, among other things, that the Bachelor-level quality is not a lower quality but, rather,

*another* type of quality which is still to be properly defined (cf. so called Dublin descriptors which seem to be a good start to be followed by a more profound elaboration).

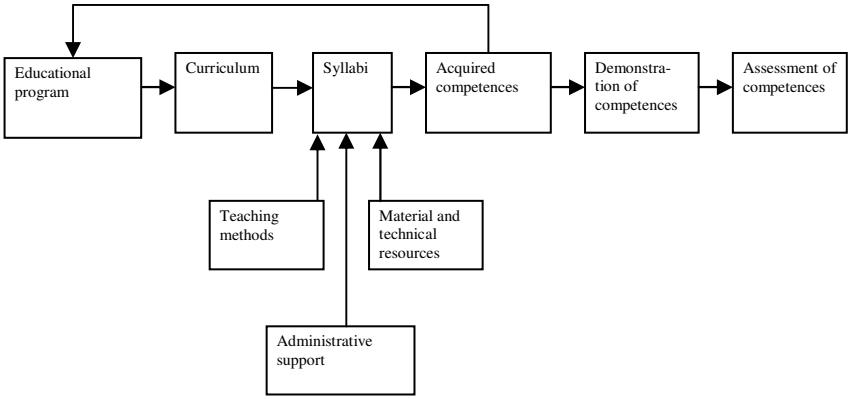
In any case, the quality we are discussing is not a 'grade of goodness' as traditionally defined by the dictionaries but, rather, a *measure of agreement* between an actual property of the thing and the latter's predefined "ideal" property taken as a point of reference. The "ideal" referred to above is not understood as the standard of perfection or the highest and best conceivable quality, but as a purely functional characteristic which could be described in terms of questions like "what is needed to do this particular job?".

In other words, before assessing the quality of educational programmes, of individual students, etc., one is supposed to have a set of points of reference whose nature is directly dependent on the *functions* to be played by learners when they graduate from their institution.

Looked at it from this angle, a study programme is a technological pipe-line made up of a number of functional *modules*. Each quasi-autonomous module adds a specific value: a specific knowledge, understanding, or skill. When integrated into a coherent system, these learning outcomes make a graduate *competent* to do the job he or she has chosen.

An overall scheme describing the educational process could be summarized as below.

*Figure 1: Educational program and its implementation*



Put into simple words, the scheme shown in Fig.1 means that while designing a programme we are led by the goal describable in terms of functional competence. The competence whose acquisition is taken as a prerequisite to specific job admittance form a necessary background to any curriculum. Curricula, in turn, are translated into syllabi. The syllabi lead learners through the chosen programme from one module to another. Then comes the evaluator's double task: to help learners demonstrate their knowledge, understanding, and skills and to assess the learning outcomes in terms of a point system or any other system designed to measure quality. It is self-understood that we are all very much interested to have commensurable systems of quality measurement; otherwise student mobility is made fairly difficult. It is also definitely preferable that the evaluators come from outside rather than from within. It is not particularly natural for a producer (for a teacher in our case) to evaluate his or her own product. This does not deny an acceptability of an internal assessment service, so long as it is a special independent service within the same HEI.

As is known, the Bologna Process has accepted the overarching qualifications' system essentially based on the Dublin descriptors. The descriptors "offer generic statements of typical expectations of achievements and abilities associated with awards that represent the end of each Bologna cycles".[1] In other words, the descriptors do the modeling of learning outcomes in terms of competences to be acquired, which, in turn, means that the descriptors show the desired *quality* of the learners upon completion of a specific cycle. While fully accepting the relevance of the adopted system, one may admit that the way the descriptors work is not quite free from overgeneralization. Thus, in some cases the expectations of skills relevant to an $n$-th cycle are practically indistinguishable from those fixed for the $(n + 1)$-th cycle. For instance, third cycle qualifications presuppose, among other things, that students "can communicate with their peers, the larger scholarly community, and with society in general about their areas of expertise", while second cycle qualifications refer to an ability "to communicate (learners') conclusions, and the knowledge and rationale underpinning these, to special and non-special audiences clearly and unambiguously".[2]

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[1] From Berlin to Bergen: General Report of the Bologna Follow-up Group to the Conference of European Ministers Responsible for Higher Education, Oslo, 2005, p. 25.

[2] Ibid., p. 26.

The expectations are practically the same, perhaps the wording for the second cycle being even more "eloquent".

The problem of quality assurance makes itself especially felt at times of reforms. Educational reforms affect society at large. Even if carried out in the most "mild" way, the reforms may run the risk of "damaging" the old system (which is intended to be changed into a new one) before the new system gets strength. Hence the utmost necessity for the introduced multi-tier system of education is to be paired with a strong and efficient system of quality assurance. As a matter of fact, such an introduction has to be *preceded* by putting into existence the quality assurance system.

There are different national systems of quality assurance. Roughly, these can be classified into more centralized and less centralized systems. It seems to this writer that a combination of a Government-run central agency which lays guidelines and, perhaps, gives legitimacy to non-governmental structures *and* a number of self-organized non-governmental agencies may be the best way of solving the problem (at least for the countries with a long tradition of the strong role played by the state).

## The Bologna Process Promoters in Russia

Even before joining the Bologna Process, in 2002 the Ministry of Education began a survey of higher education integration in (Western) Europe. At the initiative of the State University of St. Petersburg, a working team was created for the purpose, headed by the Vice-Minister for Education of the Russian Federation, the Chair of the Committee for Education and Science of the State Duma, and the Rector of the State University of St. Petersburg. The team included rectors of the most important Russian universities and international cooperation experts.The team analysed the development of higher education in Russia and Europe generally. Its work contributed to attracting the attention of the academic community to the Bologna Declaration and explanation of its significance to the public generally. After Russia had joined the Bologna Process, a Working Group for implementation of the Bologna principles in higher education was created on the basis of this team by the Decree of the

Russian Ministry of Education of 9 March 2004 (no. 1291). For a better coordination of activities for the integration of Russian and European higher education systems, by the decree of the Minister of Education and Science of 25 October 2004 (no. 100) the working group has been reorganised, its responsibilities now being as follows:

- survey of higher education in Russia;
- working out recommendations for the implementation of the Bologna principles;
- coordination of the Federal Government administration bodies towards implementation of the Bologna Process in Russia.

At present the working group is initiating a number of important projects intended to further promote the Bologna Process principles across Russia. Taking into account the size of Russia, this doesn't seem to be an easy task.

# II
# The Status Quo of Doctoral Studies

# Doctoral Education in Germany within the European Framework

*Barbara Kehm*

## Introduction

During the last ten to 15 years doctoral education and training in Germany has moved more and more into the focus of policy debates. Several factors contributed to this.

First, since the 1980s the number of doctoral degrees awarded in Germany has more than doubled and with about 25,000 doctoral degrees awarded annually Germany belongs to those countries worldwide in which the highest number of doctorates are awarded. To provide a context for this figure: In the UK about 14,000 doctoral degrees are awarded annually and in France about 11,000. In the USA approximately 1.2 percent of all citizens above the age of 25 have a Ph.D. degree, while the same figure for Germany is 1.8 percent and the average proportion across all OECD member states is 1.0 percent.[1]

Second, we can observe an increased importance of highly qualified and research related professional activities for economic and societal development within the emerging knowledge society.

Third, labour markets and career opportunities for doctoral degree holders have changed to a certain extend. They are no longer recruited almost exclusively into teaching and research functions within universities and research institutes but also into professional jobs outside academia. Germany has always been a country in which non-academic labour markets were particularly open for doctoral degree holders. Having such a degree traditionally provided access to high level professional positions not only in universities and research institutes but also in the professions, in public administration, in politics and in the private

[1] OECD, 2002.

sector. The doctoral degree thus fulfilled and continues to fulfil an important function in the reproduction of societal elites.[2]

With the growing importance as well as the growing numbers of doctoral degree holders concern about quality, duration, and completion of doctoral education and training increased as well. In the following parts of my presentation I will give an overview first of the traditions of doctoral education in Germany and second of the current forces of change at the national as well as at the European level which have contributed to the fact that doctoral education and training has become a "hot topic" on the agenda for reforms in higher education. I will then go through the main issues of concern and reform currently being undertaken in Germany and also illustrate these with a few examples of good practice. In my conclusions I will identify and summarise the main trends in current reforms of doctoral education and try to provide a look into future developments.

## Traditions of Doctoral Education in Germany

The traditional German model of doctoral education and training has frequently been characterised as the "Master – apprentice model". That implied that doctoral education did not take place within programmes or schools like it did and does in Anglo-American countries, but that it was a rather personal relationship between a doctoral candidate (i.e. they were not considered students but rather adjuncts or assistants) and his or her supervisor. Apart from colloquies for doctoral students organised by a chair holder and full-professor if he or she had several doctoral candidates, getting the degree often just involved doing individual research work and producing a thesis or having a paid position (part-time and temporary) within the framework of a research project or as an assistant for a professor. Until about the end of the 1970s, it was frequent in the humanities subjects that those students heading for an academic career finished their studies with a doctoral degree without getting any other undergraduate or graduate degree first. After that time however, it became normal to graduate with a „Magister", "Diplom" or "Staatsexamen" (the traditional German degrees after four to six years of studies) and then go on to get a doctoral degree.

[2] Enders, 2005.

*Table 1: Doctoral Degrees Awarded in Germany 1970 – 2003 according to subject groups and gender (in percent)*

| | 1970a) | | | 1980 | | | 1990 | | | 2003 | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Subject group | Total | Men | Women | Total | Men | Women | Total | Men | Women | Total | Men | Women |
| Humanities (incl. Sports) | 925 | 722 | 203 | 1,089 | 800 | 289 | 1,726 | 1,116 | 610 | 2,597 | 1,301 | 1,296 |
| Law/Economics/Social Sciences | 1,233 | 1,174 | 59 | 1,232 | 1,111 | 121 | 1,886 | 1,571 | 315 | 3,342 | 2,291 | 1,051 |
| Natural Sciences | 2,106 | 2,004 | 102 | 2,739 | 2,399 | 340 | 5,177 | 4,048 | 1,129 | 6,412 | 4,422 | 1,990 |
| Medical fields | 4,552 | 3,294 | 1,258 | 4,869 | 3,534 | 1,335 | 6,523 | 3,997 | 2,526 | 7,725 | 3,928 | 3,797 |
| Engineering | 768 | 763 | 5 | 997 | 983 | 14 | 1,400 | 1,348 | 52 | 2,153 | 1,928 | 225 |
| Agric. Fields | 144 | 132 | 12 | 331 | 262 | 69 | 549 | 410 | 139 | 501 | 331 | 170 |
| Fine Arts | - | - | - | 153 | 93 | 60 | 236 | 119 | 117 | 313 | 118 | 195 |
| Total | 9,728 | 8,089 | 1,639 | 12,221 | 9,838 | 2,383 | 18,494 | 13,353 | 5,141 | 23,043 | 14,319 | 8,724 |

a) Foreign students are not included.

Sources: Statistisches Jahrbuch für die Bundesrepublik Deutschland, 1973, pp. 96.

Wissenschaftsrat: Eckdaten und Kennzahlen zur Lage der Hochschulen von 1980 bis 2000, pp. 39.

Statistisches Bundesamt: Bildung und Kultur. Fachserie 11, Reihe 4.2: Prüfungen an Hochschulen 2003. Wiesbaden, 2003.

Doctoral degrees can only be awarded by universities. Graduates from Fachhochschulen, now called universities of applied sciences, could not change to a university after graduation and get their doctoral degree there but had to do additional course work for one or two years at a university before being accepted as doctoral candidates.

Doctoral candidates often had a paid junior researcher position, were associated to the professor and chair holder and supported him or her in teaching and research. Positions were part-time (50 percent or less of a full-time position) and temporary, mostly for up to four years. The chair holder typically acted not only as supervisor of the dissertation thesis (which more often than not was in his or her field of specialisation) but also as first supervisor of the thesis and as main examiner in the defense. There always was a second supervisor but this person could not be chosen without the consent of the first one. This implies that the position of a doctoral candidate was one of high personal dependence.

Other but less frequent forms of getting a doctoral degree were scholarships provided by various foundations, political as well as elite, or jobbing part-time and writing the thesis the rest of the time. Only a rather small proportion of doctoral candidates did their research in industry or enterprises while the thesis was supervised by a professor. Such university-industry cooperation took place in particular in engineering subjects, chemistry, and pharmacy. Drop-out was frequent (though no statistics exist) and time-to-degree on average (though varying considerably between subjects) between four and six years. Over the years the average age upon completion of the degree slowly but continuously increased across all subjects from 31 years to 32 years and it was 33 years by 2003, again with considerable differences among the disciplines. In 2003, it was lowest in the medical fields (31.6 years in veterinary medicine and 32.1 years in human medicine) and highest in the fine arts (37.0 years), it was 36.7 years in the philologies and cultural sciences as well as in sports and physical education. The average age upon completion of a doctorate in mathematics and the natural sciences, in 2003, was 32.2 years and in engineering it was 34.1 years.[3]

In the German Democratic Republic a basic system for the promotion of junior academic staff through postgraduate programmes had been established by the end of the 1960s. Between 1968 and 1970, the award of doctoral degrees

[3] Statistisches Bundesamt, 2003.

increased by two-thirds, from less than 2,900 to more than 4,700 annually. During the same period, the proportion of women who were awarded a doctoral degree increased from 18.5 percent to 30.3 percent. In the 20 year period from 1970 to 1989 the number of doctoral degrees awarded in the German Democratic Republic increased steadily almost 22,000 annually. Owing to the transformation process starting in 1990 and the large scale redundancies of East German academic staff, the number of doctoral degrees awarded fell by one-third. It slowly increased again after 1993. In 2003 altogether 23.043 doctoral degrees were awarded in both the old and the new federal states of Germany.[4]

## Forces of Change

### Concerns at the National Level

At the beginning of the 1990s, the German Rectors' Conference and the Science Council began to draw attention to severe problems that could be seen in the traditional Humboldtian "Master–apprentice model" of doctoral education in Germany. Insufficient structure, unclear status of doctoral students, increasing time to successful completion of the degree, high number of drop-outs, high degree of personal dependence on the supervisor, lack of interdisciplinary approaches and insufficient orientation to labour markets outside academia were just some of the problems which could be observed. The German Rectors' Conference suggested the introduction of graduate studies or programmes which would incorporate the model of graduate colleges. With the financial support of the German Research Foundation some graduate colleges (Graduiertenkollegs) have been set up since 1990 at a number of universities. These took the form of thematically-oriented and often interdisciplinary research groups for which there were special admission procedures but which also gave some structure to the phase of getting a doctoral degree and supported the young researchers with scholarships. Eventually until 2001, about 285 graduate colleges had been estab-

[4] For this section cf. Kehm, 1999.

lished. 27 of these are international graduate colleges, i.e. in association with partner universities from abroad.[5]

However, the model of graduate colleges did not become the rule but remained a more or less privileged exception. In November 2002, the Science Council observed that a need to reform education and training of doctoral students continued to exist in Germany.[6] In February 2003, the German Rectors' Conference followed up by publishing further recommendations concerning the organisation of doctoral studies.[7] The goals included in particular a reduction of the average age upon completion of the thesis and award of the degree, the introduction of taught elements into the phase of research training, and the acquisition of additional competences in preparation for employability in non-academic labour markets.

The German Academic Exchange Service[8] in cooperation with the German Research Foundation and with additional funding from the Federal Ministry for Education and Research (30 million Euros for the period from 2001 to 2006) have established 50 international postgraduate programmes (IPPs) in a broad range of subjects in order to advance the implementation of the recommendations for reforming doctoral education and training in Germany and for strengthening the appeal and competitiveness of German universities in the field of postgraduate education.

## Initiatives at the European Level

Let us first consider what made doctoral education such a hot topic not only in Germany but in practically all European countries. Two political events triggered these discussions.

The first one started in 1998 with the "Joint Declaration on Harmonisation of the Architecture of the European Higher Education System" issued in Paris by the Ministers of Education and Research from Germany, France, Italy and the UK. The declaration was a first step towards creating a unified structure of stu-

[5] Hüfner, 2003.
[6] Wissenschaftsrat, 2002.
[7] Hochschulrektorenkonferenz, 2003.
[8] DAAD, 2004.

dies to further reduce barriers for mobility and exchange. It was not intended to interfere with the content of studies, learning and teaching styles. One year later, the so-called Sorbonne Declaration led to the famous Bologna Declaration which has, up to now, been signed by 45 European countries. The most important part of this Declaration was the intention to create a "European Higher Education Area" until 2010 and to introduce the two-tiered structure of studies consisting of a Bachelor degree of about three years' duration as a first degree providing students with an education that enabled transition into the labour market (employability is the key word here) and – for a clearly smaller proportion of students – the offer to continue with a Master degree of approximately another two years' duration (this is called the 3 + 2 model).

The European Commission was totally surprised by this undertaking. This was what the Commission had always wanted but was never allowed to do because education was deemed to be a national responsibility. The European Commission began to support the Bologna Process which started after 1999, meaning the actual implementation on the national level of what had been decided by the ministers. At the same time, the Bologna Process triggered considerable reform dynamics in almost all European higher education systems. The ministers also agreed to meet every two years until 2010 to do a stock-taking of the implementation process. They met in Prague (Czech Republic) in 2001, in Berlin (Germany) in 2003, and in Bergen (Norway) in 2005. In 2007 they will meet in London (UK). Each of these high level meetings is prepared by a so-called "Trends Report" analysing the implementation process in the countries involved in the process. The Bergen meeting was additionally prepared by a small group responsible for stock-taking. In many countries smaller and larger studies were commissioned by the national governments to look into the national implementation processes.

For our topic concerning forces and forms of change in doctoral education, the Berlin meeting of ministers in 2003 was the most important one of the Bologna meetings so far. In the final Communiqué issued at the end of the meeting, the ministers declared their intention to include doctoral education into the new tiered structure, i.e. Bachelor degree (3 years), Master degree (2 years), and doctoral degree (another 3 years).

The European Commission reacted to this surprising development not only by actively supporting the Bologna Process but by coming up with a similar goal

in the field of research and technological development. At the Lisbon Summit in 2000, a communication from the European Commission to the Council, the Parliament and the relevant Committees was issued proposing to create a "European Research Area". In his Lisbon speech, the Commissioner for Research, Philippe Busquin, declared to make Europe the most dynamic and competitive knowledge-based economy in the world until the year 2010 and in order to achieve this, it was decided to raise the proportion of the national GDP spent on research and technological development in all member states to 3 percent, thus envisaging to raise the number of qualified researchers in Europe and to trigger further innovation.

The two processes have begun to merge: Creating a European area of higher education and a European research area in order to become a dynamic and competitive knowledge society on a global scale has not only created a renewed importance of the role of universities in terms of their task of research and research training, it has also led to a closer scrutiny of the ways in which research is currently organised.[9]

## Change Agents and Implementation of Reforms in Germany

From what has been said so far, it is easy to identify the main change agents in the reforms of doctoral education and training in Germany. Apart from the European developments which are included in the policy agenda, on a national level driving forces of change are the German Research Foundation, the Science Council, the German Rectors' Conference and recently also the German Academic Exchange Service. While the Science Council and the Rectors' Conference are influential bodies for agenda setting and making recommendations, the German Research Foundation and the German Academic Exchange Service have money for funding actual programmes, pilot projects and graduate schools. Funding is distributed on the basis of competitive bidding and those initiatives that are successful are usually thought of as models of good practice.

However, as doctoral education and training continues to be considered a matter that is part of the academic freedom, each professor can decide individually whom he or she is willing to accept as a doctoral student, what the topic for

[9] Kehm, 2004, 2005b.

the thesis might be, how much the doctoral student will be involved in the professor's research and teaching, and how much time he or she is willing to spend on supervision. Therefore, the actual change agents can only be the professors themselves who must react to incentives, take on the extra time to conceptualise a programme, cooperate with other professors to create a critical mass, design courses for the teaching part, and possibly write an application for funding, and provide more structure in doctoral education and training. Usually a doctoral programme can not be established and implemented by one person alone and also needs support from the central level of the university. In addition, such an undertaking needs extra funding.

Currently, there is widespread agreement that doctoral education and training should be given more structure to improve quality and reduce the duration until completion of the degree. The trend to establish doctoral programmes also includes some taught elements and clearer regulations of supervision and the amount of work expected from the student. And indeed, doctoral candidates in such programmes are considered more frequently to be students rather than young researchers on a paid contract.

It is possible to name one other source for changes in doctoral education and training. Due to recent and ongoing management reforms in the governance of universities and a higher degree of financial autonomy through lump sum budgets coupled with new forms of accountability and a decrease in detailed state control, performance based contracts have been introduced as a new instrument of steering. Contracts are negotiated between a university and the responsible state ministry as well as between the central level of an institution and the basic units and in negotiations with newly appointed professors. In quite a few cases performance indicators are applied which seek to increase the number of students successfully completing a programme within a defined framework of time, the amount of external research funding an individual professor or a department is supposed to attract, and an increase in the number of doctoral degrees awarded in those departments or faculties where respective figures are considered to be too low.

As all these reforms are currently ongoing, it is not yet possible to present hard data or evaluate successes and shortcomings in the implementation. In a study about models of doctoral education and training in Bavaria[10] the authors

[10] Berning and Falk, 2005.

found that between 51.3 percent of doctoral studies in the natural sciences and 85.5 percent of doctoral studies in law continue to be according to the traditional "master-apprentice model" while the rest takes place within the framework of graduate schools or doctoral programmes with more structure and taught elements. Nevertheless, they also observed a decreasing importance of the individual dissertation in favour of integration into larger research projects and an increasing importance of more intensive supervision often divided among several persons.

## Issues in the Ongoing Reforms

### More Structure for Doctoral Programmes

"More structure" in doctoral education and training is the current key word for reforming this phase of qualification in Germany. It does not only imply a turning away from the "master-apprentice model" and the individual dissertation. It also implies more formalised procedures of selection, supervision and examination, the establishment of programmes or schools, and an increase in the taught elements, i.e. some kind of study programme. Summarising the main elements of giving doctoral education more structure, Hüttl[11] emphasised three core elements:

- a competitive and performance oriented selection procedure of doctoral candidates;
- the establishment of clear responsibilities on the side of the doctoral student as well as on the side of the supervisor, including the provision of working conditions that are more closely related to the research and the topic of the thesis;
- an accompanying study programme.

In recent years more and more doctoral programmes or "graduate colleges" (Graduiertenkollegs) have been established, many of them of an interdisciplinary nature and often with an international orientation, i.e. accepting doctoral students

[11] Hüttl, 2005.

from other countries and providing courses in English. However, such programmes need extra funding and if Bavaria can be seen as an example, there is no subject as yet in which more than 50 percent of all doctorates are produced within a structured framework. With the implementation of the Bologna reforms which include doctoral studies as the third cycle in a tiered structure of studies it can be expected that by 2010 doctoral programmes will be more widespread.

## Supervision and Examinations

The quality of supervision, respectively the lack of it, has been identified as one of the main problems of doctoral education and training in Germany. Personal dependence on the supervisor, insufficient contact with the supervisor or exploitation by the supervisor have been identified as typical problem areas in this respect. Within the framework of doctoral programmes and graduate colleges (Graduiertenkollegs) it is hoped that such problems can be remedied. Written agreements (or contracts) between the doctoral candidates and the person responsible for the programme are supposed to regulate the responsibilities on each side and provide opportunities for shared supervision and more contact hours.

The oral defence of a thesis is usually a public event. As a rule there will be three examiners one of whom can be from another university or even from abroad. After a 30 minute presentation of the results of the thesis, the examiners will ask questions pertaining to the research work as such as well to the broader disciplinary or subject related field. The public is not allowed to intervene into the discussion between the examiners and the doctoral candidate. After about 60 to 90 minutes the examiners withdraw to discuss the defence among themselves and agree on a grade. The doctoral candidate is then informed about the result immediately.

There are currently no discussions as yet in Germany to change this procedure, however, if the phase of getting a doctoral degree will become the third cycle of the new tiered structure of studies including also taught elements, the weighting of the research work and the oral defence for the final grade will change to include the results of the course work.

## Doctoral Students: Status and Funding

Young researchers in their phase of getting a doctoral degree either have a status as paid employees at a university or as students. Outside of doctoral programmes and ”Graduiertenkollegs” doctoral candidates are not considered to be students. They may be contract researchers in projects funded by third parties, they may be junior researchers on half-time paid positions connected to a chair holder, or they may have a scholarship from one of the various German foundations. In the last case doctoral candidates remain enrolled as students at a university. Some universities have also created a special status for doctoral “students”.

Current regulations for contract research assistants, i.e. the typical paid position for a junior researcher with the opportunity to get a doctoral degree, provide employment for up to four years on a 50 percent basis. Of these 50 percent one third of the paid working hours can be used for doing doctoral research and writing the thesis while the rest of the time is spent on supporting the teaching and research duties of the professor who is normally also the supervisor of the thesis, the main referee of the thesis and the main examiner in the oral defence. If a doctoral candidate is funding this phase through a scholarship or paid jobs outside academia the relationship between the doctoral candidate and the supervisor becomes very informal. The doctoral candidate is more or less left alone to deal with the task ahead and will make an appointment with the supervisor to receive feedback and keep up contact after having submitted written parts or chapters of the thesis.

Status and inclusion of doctoral candidates within the working context of a university or a research institute vary considerably according to subject field. The majority of doctoral candidates in the natural sciences, in engineering, and also in economics are doing their research work within the context of an institution or a research project team. In the social sciences and humanities we find considerably higher proportions of doctoral candidates doing their research work and writing their thesis with the support of a scholarship or some type of paid work outside the university.[12]

The German trade union organising academic and research staff has for some years been making a case to take over the Scandinavian model for young researchers as paid employees of the university with full social security and all

[12] Enders/Bornmann, 2001.

fringe benefits that regular academic staff has as well. However, looking at the European developments to establish more and more internationally attractive doctoral programmes with (high) tuition fees and refined marketing and the German decision of finally allowing tuition fees, the trend will go in the opposite direction. Sooner rather than later, doctoral programmes in Germany will demand tuition fees and enrol candidates with the status of doctoral students. Currently the acceptance into a doctoral programme or a graduate college is frequently connected with a scholarship. There are no tuition fees as yet. Another sizeable proportion of young researchers getting a doctoral degree will continue to be part-time assistants and junior contract researchers on paid positions within the university.

## Quality, Competition and Internationalisation

In general, quality debates in German higher education are closely connected with the idea to make studying in Germany more attractive for students from abroad and to take up a position in the European and international competition for excellence. Teaching quality at most German universities is now evaluated on a more or less regular basis, new study programmes are accredited by external accreditation agencies, standards and assessment criteria are being developed according to European standards.

Doctoral programmes and graduate colleges are also evaluated periodically because they often receive external funding. Due to the competitive bidding for funding the concept of a programme or a graduate college is evaluated by peers on behalf of the funding organisation. However, the newly established German accreditation agencies are making first moves towards getting the responsibility (and the right) to accredit doctoral programmes as well since they are considered to be among the newly established study programmes of the third cycle according to the Bologna reforms. The criteria and standards that have been developed so far by the accreditation agencies for the accreditation of doctoral programmes are still in a rather early stage and frequently seen rather critically by the academic community.

In recent months, the Federal government and the German states have been negotiating the funding of an “initiative for excellence”. A year ago, the Federal

Ministry for Education and Research proposed to provide a large amount of money in order to finance selected universities identified to have the potential to become elite universities on an international or even global scale. The German states wanted to have extra money but went to court against the proposal because they saw it as an interference of the Federal government into their field of responsibility. In a press release from 19 July 2005, it was announced that the Federal ministry and the states finally came to an agreement. Until 2011, altogether 1.9 billion Euros will be available for the universities of which the Federal government provides 75 percent and the states 25 percent. The money is supposed to promote competition for top universities and clusters of excellence. The German Research Foundation and the Science Council will administer the money, develop criteria for spending it and establish a selection commission. The programme consists of three forms of support: Graduate schools, clusters of excellence and concepts for the future of university research. Funding is provided for these activities on the basis of competitive bidding, however, the individual states insisted on keeping the right to select those universities which are allowed to submit a proposal. That means, real competition will be prevented once again because in each of the state the state ministries will select those universities they think are top institutions. This will assure that the money will more or less be equally distributed among the 16 German states regardless of the fact that one state, for example, might have five top level universities and another state might have none.

## Relationships between University and Industry

Relationships between higher education institutions and industry in Germany have always been stronger at universities of applied sciences than at universities. But even at universities, in particular at technical universities, there are strong relationships to industry in subjects like engineering, some of the more applied natural sciences (for example, a doctoral degree is a must in chemistry in order to get adequate employment inside as well as outside academia) and often in economics as well. Since the expansion phase in Germany higher education in the latter half of the 1960s and the early 1970s, it became clear that university students needed to explore potential fields for professional activities after completi-

on of their degrees and many curricula included phases of practical work placements. In the state regulated professions (e.g. teaching, law, medicine) graduates had to go and continue to go through another 18 months of practical professional training which is completed by another examination before they can practice their professions.

Relationships between university and industry in doctoral training are frequent in certain subjects and almost non-existing in the humanities and social sciences. Still, the German labour market for highly qualified graduates with a doctoral degree has always been relatively open. While in other European countries new doctoral programmes for professional doctorates have been developed in recent years (particularly in the Netherlands and in the UK), this has not been considered a serious problem in Germany. However, with the establishment of more and more doctoral programmes including teaching elements more emphasis has been put on the development of generic skills or key qualification, for example, communication and presentation skills and project management skills. These qualifications are supposed to enhance the employability of those doctoral degree holders who graduate in subjects without a defined professional field and to enhance the professional and leadership skills of those doctoral degree holders who graduate in technical and scientific subjects. With the continuing growth in doctoral degrees awarded it has become evident that the majority will not head for a career in academia but rather seek employment in the private and public sector.

## Postdocs: Junior Professors and Careers Outside Academia

For many years, postdoctoral positions in universities were considered to be either a phase of the second formal qualification required in Germany to be eligible for a professorship (the Habilitation) or some type of waiting or holding position until an adequate employment outside the university or a research institute could be found. The principle of “up or out” continues to characterise employment in academia. All positions below the full professor with tenure are basically temporary. Often the Habilitation took another six to ten years after having been awarded a doctoral degree and upon completion candidates are awarded the title of “private docent” making them eligible for a call to a chair

but providing no guarantee for success. Due to higher education expansion and demographic factors the turnover of chair holders was very low for almost 25 years (from about the mid-1970s until the end of the 1990s). This implied that there were quite a few highly qualified persons often older than 40 years of age with no opportunity to remain in academia and being regarded as over-qualified and over-specialised for non-academic labour markets. Currently a new round of this cycle is taking place. Many professors go into retirement, young persons are called to a chair and then there might be another phase of rather low turnover.

In order to avoid this, the Federal Ministry for Education and Research created a fast track to a professorship called "junior professor" which did not require a Habilitation. The junior professorship became part of a change of the framework law for higher education in 2002. Doctoral degree holders with very good grades and not older than in the beginning of their 30s can apply for such positions which enable them to be independent in their teaching and research. They receive a contract for six years and their work is evaluated after three years. Those universities which were willing to introduce this type of position into their system were given additional funding which the junior professor could use to establish and build up a research group and the necessary infrastructure. The universities had to provide a fully tenured professorship after successful completion of the six year phase of junior professorship. Again the three of the German states (Bavaria, Thuringia, and Saxony) went to court to complain about the procedure in which the change of the framework law was undertaken but the underlying reason was undue interference of the Federal Government into their responsibilities.

The high court issued a judgement in July 2004 which ruled that the change of the framework law was not according to required procedure and that the intention to make the junior professorship the regular way to become a professor was wrong. All this was accompanied by political debates and discussions in relevant bodies and organisations about whether or not the Habilitation should be abolished. The creation of junior professorships was not altogether forbidden, but the effect of the ruling is that there are two ways to gain a professorship and eventually two classes of professors. However, since the beginning of the 1970s, there has been another class of professors already, i.e. those who were given a chair without a Habilitation on the basis of merits and reputation. This happened and continues to happen not for the majority of professorships but also not so rarely.

The survey about the careers of doctoral degree holders inside and outside academia carried out by Enders and Bornmann[13] in 1999 was able to show that in the emerging knowledge society more and more highly qualified holders of doctoral degrees are required, i.e. that no "overproduction is taking place. However, such highly qualified persons need a number of competences over and beyond their actual subject related qualifications in order to become flexible knowledge workers in the new knowledge economy. This will certainly have implications for this particular phase of qualification as well as for the traditional German pathways of becoming eligible for a professorship.

## Summary and Conclusions

The traditional German structures of organising the phase of getting a doctoral degree are currently in an accelerating process of change. At the national level concerns about the long duration of the doctoral phase as well as the quality of supervision have been voiced for quite some time. A solution to these problems was seen in the establishment of doctoral programmes to give more structure to the qualification process and to guarantee better and possibly more often shared supervision. With the inclusion of doctoral studies as the third cycle of studies in the framework of the Bologna process an international and competitive dimension has been added to existing national concerns. It could be said that doctoral education and training is undergoing a paradigmatic change in Germany insofar as it is no longer regarded as an academic affair being part of the tasks and responsibilities of the individual professor or, at the most, of the department or faculty but has moved into the focus of institutional and national policies.[14]

But there are more shifts involved in the ongoing changes. At a large EU organised conference in April 2004, a working group about the future of doctoral education and training summarised the following trends that could be noted all over Europe:

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[13] Enders and Bornmann, 2001.

[14] Enders, 2005.

- from national to international,
- from curiosity driven to result oriented (i.e. growing importance of relevance and impact),
- from individual to team,
- from narrow and discipline guided to multidisciplinary research,
- from small laboratories to larger research institutes and programmes (i.e. critical mass),
- from fragments to programmes,
- from purely academic to also professional,
- from national guarding and utilisation to competitiveness, job creation and sustainable development on a broader scale.

It still remains to be seen whether doctoral education and training in Germany will eventually be shaped according to the Anglo-American PhD model, however, since there is still a majority of doctoral candidates being trained the traditional way, we can assume that not one way of getting a doctoral degree will prevail but rather that the forms of doctoral education and training will multiply and that there will be several different forms and ways of getting a doctoral degree in parallel.

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# Recent Developments in Doctoral Education in the Russian Federation[1]

*Evgeny A. Knyazev*

The system of Russian universities is quite diverse both in terms of type of school and of branch affiliation. In addition to the Russian Ministry of Education, which was exercising its authority over 331 universities in 2001, other Ministries, including those for Healthcare, Agriculture, Internal Affairs, Culture, and Transportation, as well as Federal Security have institutions of their own. In spite of this diversity, all universities, regardless of their branch affiliation, are subject to licensing, attestation, and accreditation. These activities are regulated by the Russian Government and were until 2004 implemented by the Russian Ministry of Education. Figure 1 illustrates recent changes in responsibilities.

Universities wishing to open a postgraduate (doctoral) school or to expand the scope of major fields for the training of postgraduate and doctoral students must obtain state accreditation and have highly qualified professors and researchers in their staff. The expertise that can be mustered in support of anticipated licensing determines how well the university is prepared to offer such programmes.

One of the peculiarities of the Russian system of doctoral degrees is its two-level structure which is illustrated by the figure 2. The degrees of Candidate and of Doctor of Science are awarded. Both degrees are conferred on the basis of public defence of a thesis prepared by a student. As a rule, the Candidate degree is a necessary step towards the Doctor's degree. However, not every Candidate of Science becomes a Doctor of Science. According to data compiled by the Higher Certification Commission, a newly awarded Candidate of Science will

[1] This section is based on the presentation of Dr. Evgeny Knyazev at the Conference and his publication "The Russian Federation" in: Sadlak, Jan (ed.) 2004: Doctoral Studies and Qualifications in Europe and the United States: Status and Prospects. (Studies on Higher Education). Bucharest: UNESCO-CEPES, pp. 153 – 188.

require, on average, sixteen additional years to earn the Doctor of Science degree.

Doctoral degrees can be earned through participation in doctoral programmes or through independent study (*soiskatel'stvo*). The latter route is rather popular in Russia. For example, 25,955 independent students (*soiskateli*) were registered by the Russian Ministry of Education in 2001. The same statistics report that 54.5 percent of all doctoral theses and 38.9 percent of all candidate theses were defended following this form of preparation. The highest numbers of *soiskateli* can be found in the technical, economic, and pedagogical areas.

Students in doctoral programmes have to pass entrance examinations. Preparation programmes for entrance examinations are developed by educational institutions and organizations in accordance with the state academic standards for postgraduate vocational education. In 2001, 94.8 percent of applicants were admitted on the first attempt. But this favourable outcome may be the result of the small number of applicants.

Approximately two-thirds of postgraduate students enter postgraduate courses immediately upon graduation. In 1995, postgraduate students under the age of 26 constituted 56.4 percent of the total, and in 2000, 70.8 percent.

On 1 January 2002, 1,393 universities and research institutions in Russia were preparing specialists of the highest level of qualification. The total number of postgraduate students was 128,420. Of these, 89,828 were fulltime students. At the same time, there were 4,462 doctoral students. In all, universities trained 110,636 postgraduate students, 77,794 of them full-time students, and 3,977 doctoral students. University postgraduate schools are the primary sources of teaching staff and researchers for colleges. Some 85 percent of all postgraduate students are studying in these schools. Over the 1992 – 2000 period, the numbers of postgraduate students in Russia increased by almost 2.3 times, and, at university postgraduate schools, by 2.7 times.

In terms of statistics, an average postgraduate school trains 188 students. However, these averages mask significant discrepancies. If some universities have no more than twenty to thirty postgraduate students, others may have several hundred. Thus, Kazan State University had 622 postgraduate students in 2001 (Ministry of Education of the Russian Federation, 2001).

At the same time, there are postgraduate schools in 806 research institutes (most of them belonging to the Russian Academy of Sciences) training 15 per-

cent of all postgraduate students. Each school at these institutes has on average twenty-two students, i.e., 8.5 times fewer than in universities. One notices that, from 1992 to 1999, the numbers of students in these schools remained more or less unchanged. Only since 2000 have the figures been increasing a little, to a total of 17,784 enrolments in 2001.

The most important factor in evaluating the effectiveness of studies at a postgraduate school is the speed at which students earn their degrees. In this respect, postgraduate schools in research institutes fall considerably behind their university counterparts: with 17.8 percent versus 25.2 percent, respectively.

Table 1 and table 2 compare further quantitative aspects of doctoral studies at universities (HEIs) and at the Russian Academy of Science (Institutes of the RAS). Also, the productivity of research is considerably higher at universities than at institutes of the Russian Academy of Sciences (table 3).

Postgraduate programmes require independent work on dissertations and imply a high degree of self-motivation on the part of the postgraduate students. There is, first of all, an annual evaluation of the *aspirant* by the department (laboratory, sector). He or she must present a report describing the progress being made in preparing the dissertation as well as in preparing for the candidate examinations. The research supervisor monitors the progress of the *aspirant* in fulfilling his or her individual plan. These control mechanisms, which are rather formal, are not perfect. In some institutions, postgraduate students have heavy teaching loads. The work involved can influence the effectiveness and the quality of their dissertations. Consequently, the departments (laboratories, sectors) may pay less attention to the quality of the work of the *aspirants* during their attestations.

As a result, not all *aspirants* have sufficient time to write their dissertations. According to the Ministry of Education, in 2001, only 10 percent of *aspirants* ended their postgraduate course programmes with a dissertation defence. Some 44 percent submitted their dissertations for defence; 22 percent defended their dissertations one year after completion of the course programme; 10 percent – in two years; 11 percent – in three years (State Committee for Statistics of the Russian Federation, 2002).

Between 1998 and 2001, the overall number of dissertations defended has clearly increased (see figure 3). Given that, during the 1992 – 2001 period, the numbers of Doctors of Science doubled among the faculty and researchers in

higher education organizations, one gets the impression that the doctoral degree has become more prestigious today in Russia than in the past. Many long-term assistant professors, politicians, and heads of trade organizations have been awarded academic titles. In universities, faculty members holding the Doctorate of Science receive salary bonuses that can be as high as 50 percent of base salary.

The increasing number of doctoral degrees awarded might help to lower the average age of researchers which is currently rather high. Years of reforms and of crisis have adversely affected faculty and researchers in Russian universities. Owing to very low salaries, a large number of talented professors have migrated to more economically developed countries, or left academia to take up employment in private business and in political and governmental structures. Most of the vacancies have been filled by less qualified faculty members unable to find other positions (table 4).

However, according to the Center for Sociological Research, few students (10 percent) consider that their future careers will involve them in research and teaching. A number of reasons have been cited by postgraduate students for not intending to become researchers. These include the low prestige of research, the irrelevance of the scientific themes developed by universities, scientific bureaucracy, obstacles to the application of scientific results, the low salaries of researchers, poor scientific communication, and poor social and working conditions.

The evolution of the numbers of postgraduate students in fields of study is also of special interest, since it reflects the social and economic transformations occurring in Russia and causes changes in the demand for professionals. Thus, in 1992, postgraduate students in engineering and science represented up to 56.4 percent, a figure that decreased to 40.9 percent in 2000, and has been falling ever since. The areas of physics-mathematics and chemistry have been affected most drastically: from 10 percent and 3.5 percent, in 1992, to 6.4 percent and 2.5 percent, in 2000, respectively. At the same time, the proportion of postgraduate students in economics rocketed: from 10.2 percent, in 1992, to 18.2 percent, in 2000, with the numbers of students increasing by four times. The same is true for law students, with this segment growing from 1.9 percent to 4.9 percent or 5.6 percent, numerically. In the case of students in Political Science (respectively, 0.5 percent and 0.8 percent), numerical growth was multiplied by 4.2 times.

The effectiveness and the quality of doctoral programmes in Russia are influenced by several factors. Scarce research funding is a major drawback. The technical level of the infrastructure and the databases available for research are also critical factors. Although the situation has been changing for the better, many universities and research organizations offering postgraduate course programmes are still having serious problems (figure 4). These problems include:

- shortages of computer and copying equipment;
- lack of access to the Internet for approximately one third of the teachers;
- limited access to the electronic data bases of scientific information;
- absence of scientific literature in some fields;
- outmoded facilities;
- lack of the necessary technical supplies.

Another problem of doctoral education in Russia is that the Government could not pay faculty members adequately, it allowed people to be awarded academic titles without much effort on their part. Some took advantage of this situation. On occasion, some individuals have paid other persons to write doctoral theses for them. Included in this group are people in business and in the Government. This practice has led to a devaluation of the doctoral degree.

Since the beginning of the 1990s, international co-operation has become important for the renewal of doctoral programmes in Russian higher education institutions and research organizations. Programmes run by DAAD (*Deutscher Akademischer Austauschdienst* – German Academic Exchange Service), IREX (International Research and Exchanges Board), the Volkswagen Foundation, ACTR (American Council for International Education), the European Union, various agencies of the United States, and private funds, welfare funds, and organizations from other countries, have enabled thousands of Russian postgraduate and doctoral students to establish co-operation with their colleagues in the leading scientific centers and universities in foreign countries, and to participate in international conferences and scientific training programmes.
Further trends in doctoral studies are summarized in the concluding figure.

*Figure 1: Role of the Ministry of Education*

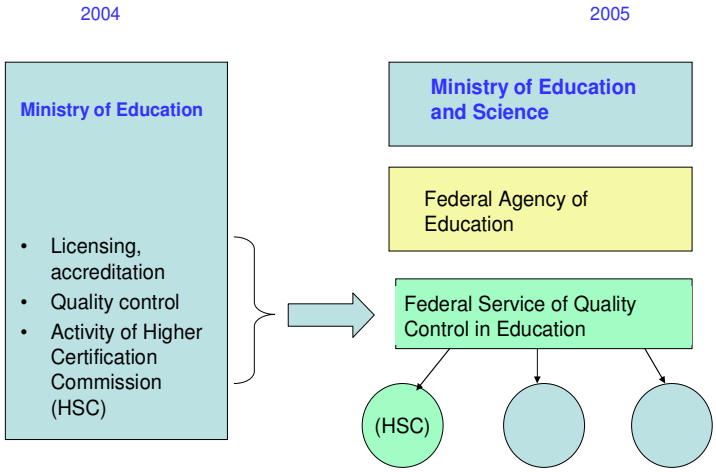



*Figure 2: Two ways to doctoral degrees*

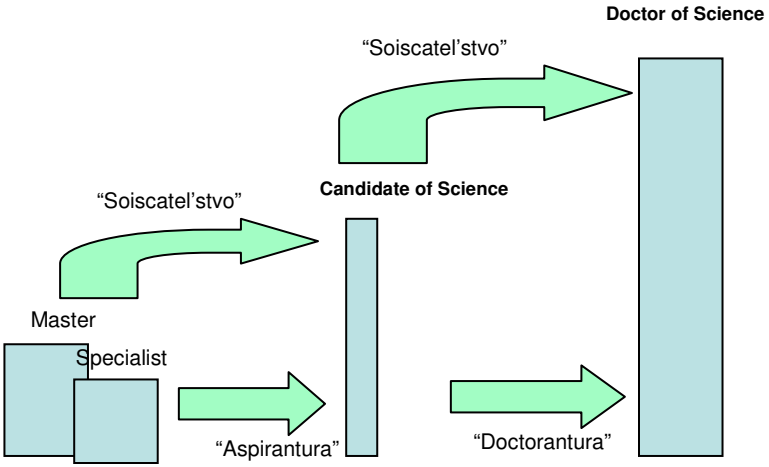


*Figure 3: Defended dissertations in institutions subordinated to the Ministry of Education, by year of graduation*

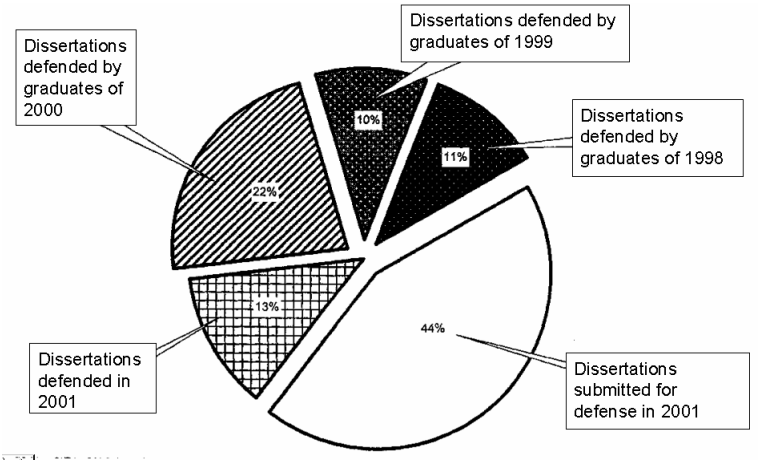



*Figure 4: Difficulties and challenges*

- "Brain-drain"
- Aging of teaching staff
- Lack of financing for research
- Low level of technical and databases for research

*Figure 5: Trends in doctoral studies in Russia*

*Table 1: Effectiveness of the advanced doctoral programmes (1995 –2002)*

| | **Number of "doctorands" 1995** | **Graduated in 1995** | **Graduated and defended in 1995** | **Number of "doctorands" 2002** | **Graduated in 2002** | **Graduated and defended** |
|---|---|---|---|---|---|---|
| HEIs | 1,707 | 336 | 96 | 4,029 | 1,127 | 376 |
| RAS-Institutes | 483 | 128 | 41 | 517 | 140 | 35 |
| Total | 2,190 | 464 | 137 | 4,546 | 1,267 | 411 |

*Table 2: Effectiveness of the Ph.D.-programmes (2003)*

| | **Number of Ph.D.-students (total)** | **Graduated in 2003** | **Graduated and defended Ph.D.-thesis in 2003, %** | **Budget costs per Ph.D.-student (thousand rub.)** | |
|---|---|---|---|---|---|
| | | | | **average** | **Per graduated and defended Ph.D.- thesis** |
| HEIs | 121,782 | 26,463 | **28.5** | 14 | 49 |
| RAS-Institutes | 8,194 | 1,937 | **11.6** | 14 | 121 |
| Other institutes | 10,765 | 2,399 | **25.7** | 14 | 54 |
| Total | 140,841 | 30,799 | | | |

*Table 3: Productivity of Research (2003)*

| | **HEIs (per 100 academic staff members)** | **Institutes of RASc (per 100 researchers)** | **Industrial Laboratories (per 100 researchers)** |
|---|---|---|---|
| Articles | 140 | No data | No data |
| New technologies | 0.73 | 0.02 | No data |
| Patents | 1.7 | 1.1 | 3.3 |

*Table 4: Average age of researchers*

| | **1994** | **2003** |
|---|---|---|
| Total | 45 | 48 |
| Doctor of Science | 58 | 60 |
| Candidate of Science | 49 | 53 |

# III
# Initiatives and Best Practice for Developing Doctoral Studies

# Re-designing Doctoral Education

*Vladimir N. Troyan*

In the context of the Bologna Process, postgraduate education (doctoral studies) is considered as a third cycle of educational programmes. As in Germany, in Russia there are also two post graduate degrees: the first one corresponds to the German doctorate and is called "candidate of sciences" (Kandidat nauk). The second one is "doctor of sciences" and corresponds to the German habilitation.

The "Law of the Russian Federation on higher and post-university professional education" outlines the basic principles of doctoral education. It stipulates that, in order to earn a post graduate degree, students have to have completed university and post-university professional education and have successfully passed the terminal examinations. (Article 7. 1)

Two approaches to postgraduate studies can be distinguished:

(1) Postgraduate studies as a post-university programme aiming at the preparation of a doctoral thesis. The defence of the thesis, however, is not compulsory.
(2) Postgraduate studies preparing for the degree "candidate of science" and therefore including the compulsory defence of a doctor thesis as the final work.

According to the law, to be accepted for a postgraduate programme (doctoral study) applicants have to pass a competitive selection which is based on their results in the following three examinations:

- Knowledge with respect to the speciality of an academic discipline which the subject of the Ph.D. thesis belongs to,
- philosophy and history of science,
- foreign language.

For those applicants who are accepted, the duration of postgraduate education is three years. During this period postgraduate students receive a research grant and a place in a dormitory. Postgraduate education includes:

- Research and the writing of a Ph.D.-thesis,
- a subsequent candidate examination referring to the following fields:
  - speciality of an academic discipline (two parts: general and referring to the subject of the Ph.D.-thesis),
  - philosophy and history of science,
  - foreign language,
  - the organisation of lectures and seminars,
  - pedagogical practice.

After completing postgraduate education, Ph.D.-students have to defend their doctoral thesis. The defence takes place at that one of the Dissertation Councils which is specialized in the academic discipline and the speciality of the thesis. Dissertation Councils consist of leading scientists from the university where the thesis was written and of other universities in the region and also of scholars belonging to research institutes of the Russian Academy of Sciences. Members of the Dissertation Councils are recommended by their universities and then approved by the Higher Certification Committee at the Ministry of Education and Science. Among them, there are "candidates of sciences" (Dr.) and "doctors of sciences" (Dr. habil) as well. Members of specialized Dissertational Councils for awarding the second doctoral degree have to hold the degree of "doctor of sciences" (Dr. habil).

The procedure of the defence at the specialized Dissertation Council is as follows:

- Presentation of the results of the thesis (20 min),
- questions,
- comments of the division, where the Ph.D.-student studied, an opponent institution which may be a university or an institute of the Russian Academy of Sciences and two further opponents,
- free discussion,
- secret vote.

The vote of the Dissertation Council has to be confirmed by the Ministry of Education and Science. For this purpose, a verbatim report of the defence, the

thesis, and other documents are sent to the Higher Certification Committee. The Special Expert Council at the Higher Certification Committee examines the thesis and after that confirms or rejects it.

Although in accordance with the new legislation, students holding a Bachelor's degree may be accepted as postgraduate students, the leading universities in Russia usually accept only professionally qualified specialists (5 years of university study) or graduates of a Master's programme for postgraduate education.

As a consequence of the introduction of Bachelor's and Master's degrees, two different kinds of post-university professional education programmes preparing doctors (candidates of science) were established by law – post-Bachelor's and post-Master's programmes.The two variants are as follows:

Variant 1 (post-Master's programmes):

- 4 years of Bachelor studies,
- 2 years of Master's studies,
- 3 years of post-Master's programme preparing doctors (candidates of science).

The set duration of post-Master's postgraduate programmes is 3 years. An academic Master's degree is required to be accepted for this kind of programme. Those students who have successfully completed a post-Master's programme for postgraduate students and have successfully passed the terminal examination and defended a doctoral thesis, are awarded the doctoral degree by a university.

Variant 2 (post-Bachelor's programmes):

- 4 years of Bachelor studies,
- 5 years of post-Bachelor's programme preparing doctors (candidates of science).

The set duration of post-Bachelor's postgraduate programmes is 5 years. An academic Bachelor's degree is required to take part in these programmes. Those students who have successfully completed the post-Bachelor's programme and successfully passed the terminal examination and defended the doctoral thesis, are awarded a doctoral degree by a university.

The programmes for postgraduate students are developed and approved by the universities themselves taking into account the requirements of the Federal

Law. The education components of a post-Bachelor's programme for post-graduate students are developed on the basis of the main requirement set for the education components of the corresponding Master's programmes.

A promising perspective for doctoral education are joint international Ph.D.-programmes. An interesting example is the „Joint Saint Petersburg and Grenoble Universities Ph.D.-Programme". It works as a "sandwich" programme with the following characteristics:

- Two supervisors from each university,
- students spend one year in Russia and one year in France,
- defence of the thesis is possible either in France with the presence of two Russian Professors or in Russia with the participation of two French professors.

It is necessary to highlight that the indispensable condition for the successful functioning of this programme during its 6 years of existence is an agreement between Russia and France about the mutual recognition of scientific degrees awarded by universities in the two countries.

Conclusions: It is suggested that the approach to postgraduate studies should be precise as a higher step in a multi-level educational system which is implemented through a programme with obligatory defence of a doctoral thesis and the awarding of a corresponding diploma.

To maintain an acceptable level of quality in the preparation of postgraduate students it is advisable to refuse a model of a 3-year postgraduate programme for students holding a Bachelor's degree.

# Development of Third-Level Education in Technical Universities[1]

*Sergey F. Podlesny*

## Urgency and Challenges

All over the world, demand in elite-level engineering and technology specialists grows up. As this takes place, third-level vocational training should appropriately respond to the requirements of innovative economics and its globalization. Required is harmonization of third-level programmes in Russia and European countries in accordance with the Declaration of Bologna.

The higher education system in Russia is confronted with the following challenges:

- Third-level training structure and contents fail to meet the requirements of innovative economics and prospective technological schemes;
- third-level education systems in Russia and European countries differ significantly;
- employers seldom participate in academic programmes development;
- huge amount of time is spent on mastering additional subjects in Russia;
- advanced IT are insufficiently employed in the course of learning (e-learning);
- third-level student academic loading does not necessarily cover the thesis scope;
- poor command of a foreign language;
- lack of commercial-based evaluation of the intellectual property developed in the course of a thesis development;
- scarce state-level funding of third-level programmes.

[1] This section is based on the Powerpoint presentation delivered at the Conference in Kassel.

## Standard and Legislative Grounding

Temporary requirements to the basic academic programme of third-level vocational training (2002) have to take into account that third-level school objective is qualifying highly professional research, teaching and learned staff for science, education and industry fields. Post-graduate training objectives include the formation of skills for independent R&D and educative activities, advanced learning of theoretical and methodical basics for engineering and technologies, improvement of philosophy education including the one oriented at vocational activity, and higher foreign language level including its employment for vocational activity.

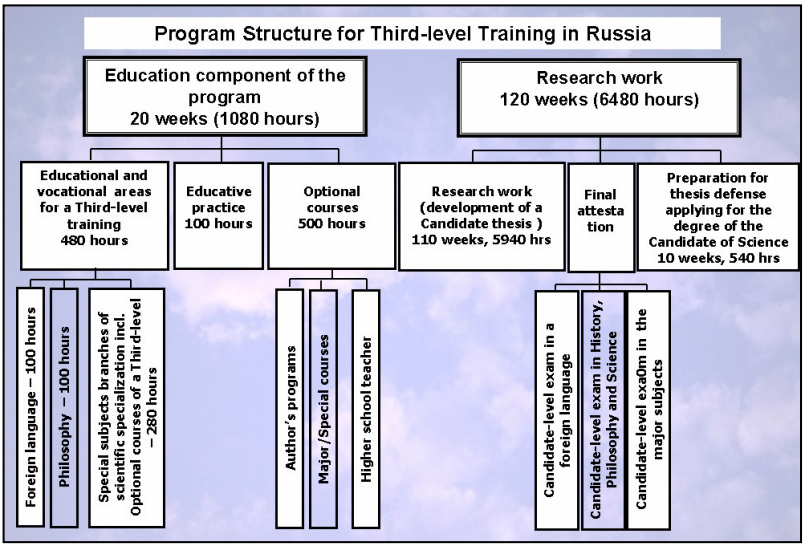
With regard to third-level training structure up-grading and contents up-grading, components of the basic education programme for third-level education in Russia include:

- Educative and major subjects (EMS cycle),
- optional courses (OC cycle),
- educative practice,
- R&D activity,
- final attestation;
- preparation of a thesis and its submitting to the Dissertation Council.

A pattern programme system for third-level training in Russia covers:

- 1. year: intensive training work at methodical seminars on subjects, with participation of invited specialists to work out methods and methodological scientifically novel points; preparation of publication; preparation and passing of Candidate-level exams in history, philosophy and science.
- 2. year: experimental work, theoretical analysis; results implementation into the learning process with simultaneous fulfillment of academic commitments, development of scientific and methodical guides for the university; publication and other modes of research approbations.
- 3. year: complete qualification paper development; simultaneous mastering of academic programmes (innovative management, project management; science-intensive production); presentation of basic outcomes in research and education public community; passing the Candidate-level exams in the major subjects.

*Figure 1: Programme structure of third-level training in Russia*




## International Collaboration within the Framework of Third-level Training

From Russian perspective there is demand for

(1) wide intensive collaboration of universities and employers in different countries in the field of doctorate programme development and realization,
(2) implementation of joint doctorate degrees,
(3) international mobility realization at the doctorate level,
(4) agreement on the definitions for joint degrees, as well as the basic principles of their formation, realization and recognition,
(5) working out of common European characteristics for all the three levels of education and joint degrees.

It is suggested

- to form international consortiums out of the leading scientists for developing recommendations on the contents of doctorate (post-graduate) training programmes, on training, and thesis defense with the target of unification within the framework of Bologna Process;
- to increase the state-level funding for the doctorate (post-graduate) training in the field of engineering and technology, including national and international foundations and to establish budgets in each university for elite-level specialists qualifying within the third-level training based on international agreements.

# Conditions for a Successful Doctorate: General Framework and Motivation in Germany

*Max Reinhardt*

Discussing the Ph.D. phase is necessary. The general framework is an important precondition for the doctorate. Thus, we have to ask: How does the situation of Ph.D. candidates look like? What should be enhanced? How are Ph.D. candidates motivated to do their doctorate? The author tries to answer these questions on the basis of statistical data and his own experience in the field of science.

## Statistical Basis for Doctorates in Germany

About 100,000 Ph.D. candidates do their doctorate in Germany.[1] 23,043 finished their Ph.D. in 2003. On average it takes four years to be awarded a Ph.D. The average age of being awarded a Ph.D. is 33. The average age of entering the entry qualification is 29.[2] Generally the entry qualification is an excellent Master´s degree, usually achieved by studying eight semesters at a university. It is possible to do a doctorate being graduated by a university of applied sciences (Fachhochschule) if a professor of a university supervises the Ph.D. candidate. The Bachelor is a possible entry qualification for the Ph.D. It depends on the rules of the particular university because Germany has no uniform regulation.[3] One further condition is that a professor of a university supports and supervises the candidate. This is a main reason for the high rate of doctorate holders in Germany. The professor offered to 47 percent of the Ph.D. candidates the chance to do a doctorate. 53 percent asked the professor to do their doctorate. 16 percent

[1] BMBF / KMK 2004, p. 10.
[2] Statistisches Bundesamt, 2004.
[3] DAAD, 2005.

applied because of a job advertisement and 10.4 percent were commended by another professor (multiple answers were possible).[4]

## General Framework for Doctorates in Germany

### The survey of THESIS

To know more about the Ph.D. candidates, THESIS – The German interdisciplinary network for young scientists – implemented a survey with about 10.000 participants in 2004 to have a better overview of the situation and motivation of Ph.D. candidates. The diversity on subjects of the interviewees is almost the same as the official data.[5]

*Table 1: Doctorates in Germany according to subjects (in percent)*

| | Doctorates | Interviewed persons |
|---|---|---|
| Mathematics and natural sciences | 41.7 | 42.6 |
| Languages and cultural science | 15.2 | 16.3 |
| Engineering | 14.8 | 14.9 |
| Jurisprudence | 10.5 | 4.5 |
| Economics | 6.5 | 9.2 |
| Social sciences | 2.9 | 4.9 |
| Other subjects | 8.5 | 7.6 |
| Total | 100.0 | 100.0 |

Source: duz special, p. 12.

[4] Berning / Falk, 2005, p. 56.

[5] duz special, 2004, p. 12.

## Different Routes to Do a Doctorate

1.8 percent of the citizens in Germany with an age over 25 are doctorate holders compared with 1.0 percent average within all OECD countries.[6] In Germany, the doctorate makes possible the access not only to research and the university but as well to all sectors of the labour market like the public sector, politics, and the private sector.[7] Thus, the Ph.D. reproduces the elite in Germany. This is unique in Europe and worldwide. Especially in Italy, Poland, and Spain the Ph.D. mainly performs the reproduction of the scientists working in the universities or research institutes.[8]

## Gender

The survey of THESIS shows that 70 percent of the male and 60.2 percent of the female Ph.D. candidates are doing their doctorates as scientific assistants at the university, research institute or by the way of third part funding. Only 7.6 percent of the male in contrast to 10.9 percent of the female Ph.D. candidates are participants of a postgraduate programme, 10.4 percent male but 16.2 percent female are fellowship holders or individually financed and 12.0 percent men and 12.7 percent women are external Ph.D. candidates. This shows that the track as scientific assistant is the predominant one especially for the male gender, enabling a good access to a scientific career.[9]

## Financing

The survey shows that for 69.3 percent of the Ph.D. candidates the main source of financing their subsistence is to work at a university, a research institute, or for a research project.

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[6] OECD, 2002.

[7] Enders / Bornmann, 2001; Hartmann, 2002.

[8] Kehm, 2004, p. 293.

[9] Gerhardt / Briede / Mues, 2005, p. 81.

The advantage of the status as a scientific assistant at a university or a research institute (46.2 percent) is being integrated into the work of the scientific community.[10] His tasks are to teach, to apply for research projects or to participate in research projects and to work together with other young scientists in a team. As a scientific assistant, the Ph.D. candidate can make his experience in the scientific community to prepare for a career path in science or research and to gain the qualifications for such a career. Another advantage of a contract of employment is the salary and the social assurance. But the Ph.D. candidate as an employee often is too busy with many tasks not concerning his doctorate. Whether or not this extends the time to do his doctorate depends on the supervisor and his kind of supervision.

The integration into the scientific field is similar for Ph.D. candidates with third party funding (20.6 percent) maybe except for being obliged to teach. The employment in university projects outside Ph.D. work (2.5 percent) is for a Ph.D. candidate a comparable situation like to be an assistant.[11] He is integrated into the scientific community. The degree of being integrated depends on the work he has got to do.

18.7 percent of the candidates finance their subsistence with a fellowship as main source. This shows the significance of the fellowships for the Ph.D. phase, especially in arts and social sciences except economics.[12] The advantage of being an external Ph.D. candidate is to be independent of other tasks in the university. The disadvantage is the missing of being integrated into the university.

The flexible system, the different routes to a doctorate, and the relevance of the Ph.D. for the employment market in Germany induce each other. The possibility to do a doctorate as an employee outside the university (6.6 percent) underlines this flexibility. It is a good chance for an exchange between research and other sectors during the Ph.D. phase.

Most interruptions of the dissertation are found with scientific assistants and external Ph.D. candidates.[13] This shows the necessity to free these Ph.D. candi-

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[10] Gerhardt / Briede / Mues, 2005, p. 83.
[11] Gerhardt / Briede / Mues, 2004, p. 83.
[12] duz special 2004, p. 15.
[13] Gerhardt / Briede / Mues, 2004, p. 89.

dates of the additional work. Other financing of the subsistence is not so important as a main source, but as an additional source.[14]

## Bologna Process and Consequences

The declaration of the doctoral level as the third cycle should not minimize the options of going different routes to do a doctorate in Germany. Neither should be a contract of employment nor a scholarship be the usual way of doing one's doctorate. There should be different ways because of different demands of the field of science. THESIS hopes that the Bologna-Process advances the integration of the Ph.D. candidates within the universities or institutes. The graduate schools and graduate colleges are exemplary, but only about 8 to 10 percent per age group get the opportunity to work within.[15]

The graduate schools and graduate colleges, established during the last years, offer a mixed status with the possibility to concentrate on doing the doctorate and a special integration into the university. Consequently, it should take a relatively short time to be awarded the degree. The average time to finish the doctorate at the graduate colleges of the German Research Foundation for example, is 0.5 years shorter than other doctorates. Especially for arts, there is an obvious difference of 1.3 years comparing structured routes with other ways to do a doctorate.[16]

As formulated in the communiqué of the European Ministers for the Bergen Conference 2005, in Europe more structured doctoral programmes should improve the situation of Ph.D. candidates. A second point is "the need for transparent supervision and assessment."[17] The length of the Ph.D. phase in Europe is 3 to 4 years. A third point is offering Ph.D. candidates additional seminars like "interdisciplinary training and the development of transferable skills."[18] These points would enhance the chances for access to other sectors of the employment

[14] Gerhardt / Briede / Mues, 2004, p. 82.
[15] Enders 2005, p. 36; Gerhard / Briede / Mues 2005, p. 81.
[16] Buckow 2005, p. 9.
[17] European Ministers 2005, p. 5.
[18] Ibid.

market than universities or research. The aim is to increase the numbers of doctorate holders in Europe. Because of the diversity of the ways to do a doctorate the communiqué of the European Commission describes the Ph.D. candidates "in third cycle programmes both as students and as early stage researchers."[19] The implementation of the European Credit Transfer System should enhance the transferability of the different systems and the acceptance of the achievement. The description of the outcomes is one more step towards transparency and enables the mobility.[20]

Norway is a good example for promoting Ph.D. candidates. They have a fellowship for four years, including social assurance and maternity protection. A contract signed by Ph.D. candidates, the supervisor, and the institution about their rights and duties includes a yearly report about the dissertation, the theme of the dissertation, the term of the contract, the conditions of the workplace, form and content of the seminars, and the regular meetings between supervisor and Ph.D. candidate.[21]

## Need to change

### Need to Change from Ph.D. Candidates' Point of View

The interviewees see many possibilities to improve the Ph.D. phase. Important for the Ph.D. candidates are the following conditions:

- to find a better job as young scientist, e. g. an employment contract for an unlimited period, tenure-track (80.4 percent);
- social security for all Ph.D. candidates (75.0 percent);
- better conditions for Ph.D. candidates with a child or children, e. g. fellowships for parents (70.9 percent);
- a better salary for Ph. D. candidates (65.5 percent);
- additional courses for rhetoric, didactics, human resource management and economic knowledge skills (70.2 percent);

[19] Ibid, p. 4.
[20] European Commission, 2005, p. 4.
[21] Kupfer, 2003, p. 67.

- better chance to experience staying abroad (73.3 percent);
- better chance of experience teaching (57.3 percent);
- being integrated into postgraduate programmes or the like (57.8 percent);
- a better structured Ph.D. phase, e. g. courses parallel to the dissertation (54.6 percent);
- time limitation for the Ph.D. phase of three to maximum four years (46.5 percent).[22]

Only 10.9 percent are rather not satisfied and 4.3 percent not satisfied with the supervision. 23.9 percent are absolutely, 40.1 percent are rather, and 20.7 percent are partially satisfied.[23] This result shows that there are possibilities to improve the supervision. The supervisor should spend more time for supervising. He should ask more frequently for the progress report (42.3 percent) and give a better motivation (31.3 percent).[24]

## Time Needed for the Tasks

55.1 percent of the time Ph.D. candidates work for their dissertation. They need 18.2 percent for other projects, 17.1 percent for teaching and supervision, 11.3 percent for other scientific or organizational work, and 9.4 percent for subsistence.[25] This shows that almost half of the time is used for other work. The Ph.D. candidates should be disburdened during main phases as Ph.D. candidates in order to finish their doctorate. Especially for 34.9 percent of the Ph.D. candidates in arts there are too much other work, the subsistence and the family main points for interrupting their Ph.D. phase. Only 22.3 percent of the other Ph.D. candidates mention too much other work, organizational problems, having doubts about their own abilities, complexity of the theme as a reason to interrupt.

There are two main reasons for doing a doctorate during lengthy 5 years: Too much other work, indistinction of the theme and, as a consequence, too extensive dissertations with a length of 400 pages and more which should be a postdoctoral thesis.

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[22] duz special, 2004, p. 27 f.
[23] Gerhardt / Briede / Mues, 2005, p. 86.
[24] Gerhardt / Briede / Mues, 2005, p. 87.
[25] Gerhardt / Briede / Mues, 2005, p. 88.

Clear criteria for evaluating the opus, a reduction of additional work at the end of the Ph.D. phase enabling the candidate to concentrate on finishing the dissertation and a fast revision of the dissertation are necessary to shorten and to improve the Ph.D. phase. This could be part of a contract such as in Norway. The Ph.D. candidate should also learn skills like the acknowledgement of the scientific community and specializing in the method of the subject. Experiencing scientific exchange, teaching or participating in research projects in the middle of the Ph.D. phase is important, too.

Reducing the number of Ph.D. candidates, one person has to supervise, to about 20 would improve the quality of the Ph.D. phase. The supervisor should have time for supervising his Ph.D. candidates. Training the teacher to enhance the quality and the obligatory nature of the supervision are two further preconditions for a better Ph.D. phase. In order to shorten the time for appliance of financial support from foundations or institutes, it is necessary to have a good view on these possibilities at the beginning of a Ph.D. phase or maybe at the end of a fellowship, for example, after finishing a post graduate programme of three years.

## Motivation to Do a Doctorate

The majority of the Ph.D. candidates started their Ph.D. because of their interest in scientific work (87.1 percent), being interested in the theme (85.2 percent) and in the methods and theories of the subject (71.1 percent). To enhance the chances for the career was also important. 76.1 percent of the interviewees saw the Ph.D. as a good precondition for their targeted profession. 59.9 percent were interested in a scientific career and 45.4 percent wanted to enhance the chances for finding a better job. 41.5 percent want to better their later income.

Just 22.1 percent answered that their family expected them to do so, 22.7 percent wanted to extend their time at the university – the student feeling.

Because of the high rate of unemployment, it is possible that many Ph.D. candidates started their Ph.D. because of problems with their career, but only 14.1 percent answered they had no other interesting job. 9.7 percent answered they had no job at all. 6.0 percent answered the professor motivated them to do a

doctorate.[26] In summary one can say that the majority of the Ph.D. candidates started their Ph.D. because of a high interest and not because of the high unemployment rate.

## THESIS: A German Network for the Exchange of Young Scientists

Many Ph.D. candidates are not really integrated into their university. This is one of the main reasons for founding the network THESIS. It was established in 1991 and has 560 members of about 70 subjects and 150 universities in 140 cities in Germany and abroad. THESIS enhances the chance to get enough information for doing the doctorate in an average or shorter time. THESIS is a private, nonprofit, nongovernmental organization to promote the exchange of young scientists in Germany. The network structure based on competent members realizes a professional exchange about different themes concerning the career path. Our local meetings, our periodical THESE and the seminars for special competences like paper writing skills, rhetoric and business formation are helpful for the career path.

Our mailing-lists are used to discuss different problems involved by doing a Ph.D. Furthermore, THESIS organizes conferences about different themes concerning the Ph.D. phase or special scientific questions.

We are partner in talking to players in the science field like the Science Council, the German Rector´s Conference, the Federal Ministry for Education and Research, the German Academic Exchange Service and others. We are invited to discussions concerning the problems of young scientists.

The interest of Ph.D. candidates to become a member of THESIS shows that there is a need to exchange views with other young scientists. There are many questions during a career path to be answered: what are the formal qualifications to do a doctorate, especially to do it being graduated by an university of applied sciences (Fachhochschule), method skills, legal framework, problems with the supervisor, the examination, publishing, and other questions.

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[26] duz special, p. 13.

## Conclusion

Better possibilities for exchange, additional skills, a better financing and supervision are important points to enhance and shorten the Ph.D. phase. The diversity of the different ways to do a doctorate should be maintained and the number of Ph.D. candidates increased. The advantage of the German system is the high applicability of the Ph.D. candidates for all sectors of the employment market, but the shortcomings should be solved. The problems of additional work for scientific assistants and external Ph.D. candidates and the anonymity of fellowship holders should be solved by a contract for the supervision and the duties and rights of the Ph.D. candidates.

Furthermore, to know more about the Ph.D. candidates is an important precondition for a better and higher mobility in Europe. The author, President of THESIS in 2005, wanted to contribute to this aim.

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# Standards for Doctoral Programmes: Are there Organizational Determinants to Successfully Support Doctoral Candidates?

*Nicole Thaller*

## Introduction

In its intent, the Ph.D. thesis does not just contribute to scientific progress, but also provides the cornerstone for a researcher's personal scientific profile. A Ph.D. can be interesting both for the academic and the non-academic labour market. Since occupational careers at doctoral levels have already been investigated[1], the examination of different vocational fields will not be our topic of interest. Our focus is the education of Ph.D. students as an important qualification step for a career in academia. Within the scope of the Bologna Process, the doctoral phase is chosen not only as the third cycle besides Bachelor and Master but also to bridge the European Higher Education Area and the European Research Area.[2]

Yet, US-universities still lead international university and research rankings[3] despite European policies designed to foster restructuring of doctoral programmes. Whereas on the one hand some countries have successfully reorganized the doctoral phase, Germany on the other hand is still a latecomer. Conditional on the introduction of the junior professorship and the abolition of the state-sanctioned doctorate ("Habilitation") in Germany the Ph.D. gains more and more importance. These reforms, formulated in the state academic guidelines ("Hochschulrahmengesetz"), show that the topic is highly important and up-to-

[1] Enders and Bornmann, 2001.

[2] Kehm 2005, Berning/Falk 2005, Elton 2005.

[3] Combes/Linnemer, 2003; Coupé, 2003.

date. All in all the formulation of Ph.D. education is restricted to a minimum in the state laws ("Ländergesetze"), and writing them out in full will be left to the governing institutions ("Promotionsordnung") of the universities. Regarding the pre-conditions for the employment as a junior professor, the period of acquiring a Ph.D. becomes a decisive criterion which can be found in the corresponding state law, because temporary contracts for researchers without holding a Ph.D. degree are possible only for a period of six years in Germany.

The paper is organized as follows: first, we will give a brief overview of key aspects of doctoral education. Then we will have a closer look at the types of doctoral education and our focus of research. The next two sections will be about the characteristics of doctoral education and the organizational structure. After this theoretical part we will present some results from our investigation. We will start with publication as an example for performance. In the last section we will present some preliminary results for the characteristics of doctoral education and the organizational structure. As we will not restrict our research to Germany in our further investigations, but compare the programmes found in Germany with those in other European countries, we will concentrate on the subject of "economics" as its content and structure seem to be internationally quite similar. In this manner, we hope to avoid results generated due to different production conditions but referring to the differences in the types and characteristics of doctoral education.

## Key Aspects of Doctoral Education

In Germany the education of early stage researchers is concentrated in only a few universities.[4] For example, only six departments granted doctoral levels to 34.5 percent of later professors for economics. A similar example is mentioned by Mayer,[5] in which one half of all state-sanctioned doctorates ("Habilitation") come from just 20 percent of all economic departments. These statistical observations are noteworthy since governmental university policy traditionally seeks to foster a homogenous academic landscape without promoting "an elite"; how-

[4] Welsch/Ehrenheim, 1999; Schlinghoff, 2002.

[5] Mayer, 2001, p.431.

ever, reality draws a different picture: latent preferences for some departments do exist in reality.

In this light, a closer look at public policies is needed. Due to the introduction of the junior professorship and the abolition of the State doctorate ("Habilitation"), the Ph.D. gains more and more importance. Within the scope of the Bologna Process the doctoral phase is chosen as the third cycle, besides Bachelor and Master, to bridge the European Higher Education Area and the European Research Area. In Germany, the state academic guidelines ("Hochschulrahmengesetz") are modified. All in all the formulation of the doctoral education is restricted to a minimum in the state laws ("Ländergesetze") and writing them out in full will be left to the graduation regulation ("Promotionsordnung"). All these reforms in academia belong to a framework leading to the so-called New Public Mangement.[6] The New Public Management is typically expected to put more weight on external control, competition, and hierarchic self-governance, while restricting academic self-organization. The assumption behind these management ideas – adapted from the sphere of private business enterprises – is that external incentives, state-run rules of financing ("performance-related financing"), competition about reputation ("ranking") or the centralization of decision making will initiate change. The traditional and still dominant method of university organization in Germany will be referred to as the "status quo". Figure 1 shows the differences between these two modes of university organization, collegial versus managerial, illustrated as an ideal conception.

*Figure 1: Comparison of governance forms*

| | NPM | Status quo |
|---|---|---|
| Academic self-organization | - | + |
| External control | + | - |
| Competition | + | - |
| Hierarchic self-governance | + | - |

Source: Schimank, 2002b, p. 18, adapted.

[6] Schimank, 2002a; Schimank, 2002b.

As one will receive a Ph.D. from a university, it is important to analyse the institutional structures within universities as they could be determinants for different successful doctoral programmes. At the university level we can identify different types of education. We will distinguish the traditional approach from structured programmes. These two types of doctoral education differ in their characteristics as we will show in the following. The question we will ask refers to the academic outcomes. Publications, citations, conference presentations etc. are measured as forms of successful outcomes. Will the traditional or the structured approach promote more successful early stage researchers?

## Types of Doctoral Education

The two types of doctoral training we investigate are the traditional and widespread approach versus more structured programmes. The traditional, single-supervised approach was and still is common use in Germany. It implies a very close and personal relationship between supervisor and the Ph.D. candidate. The doctoral students are not integrated in a formal study programme, instead the qualification is not systematic and depends on their supervisor's engagement. Often supervisor and candidate know each other from the university, meaning that professors recruit their new doctoral candidates from among their students. One can imagine this form of doctoral education as a Master-apprenticeship model. In Germany, most doctoral candidates receive their Master degree and their Ph.D. from the same university.

In contrast, persons who decide to participate in a structured doctoral programme change the university after the Master and for the Ph.D. more often. These programmes are often structured in the way of a graduate school, a research training group ("Graduiertenkolleg") or a graduate centre. So the doctoral education is no longer an individual initiative between one supervisor and the Ph.D. candidate, but different supervisors and many doctoral candidates are involved. These collective programmes are often more structured, including an obligatory course program, a strong orientation towards research and clear rules for application and the selection of new candidates.

The most well-known form of structured programmes in Germany are the research training groups ("Graduiertenkolleg") supported and financed by the German Research Foundation (DFG). They are temporary in nature with a maximum duration of nine years. In the year 2002, only two percent of all Ph.D. theses were written within such a research training group.[7]

## Focus of Research

As level of analysis we will investigate successful versus mediocre economics departments in Germany and their type of doctoral education. Our analysis is motivated by the assumption that the mechanisms of New Public Management will foster success through competition, incentives, and sanctions. The contemporary decision makers' politics believe in financial incentives. We want to investigate if this assumption from the economic standard model is true in the case of university professors. Furthermore, we suppose that the mechanisms of New Public Management will have more influence on structured programmes than on the traditional apprenticeship model.

The next two sections will broach the issue of the main differences between the traditional approach in Germany and the more structured approach of doctoral education. One important distinction between the two models is their education goal. The doctoral studies programmes should qualify for a career in academia while the traditional German model is used as a qualification for the academic and the non academic labour market.[8] We will start with the characteristics for both types of doctoral education. Second, we will give the reader an impression about the main differences in their organizational structure.

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[7] DFG, 2003.

[8] Berning/Falk, 2005, p. 50.

## Characteristics of Doctoral Education

We tried to identify important characteristics for a successful doctoral education. As analytical level we will have a closer look at the application and selection procedure, the matching between supervisor and Ph.D. candidate, the relationship between supervisor and candidate, the introduction and integration into the scientific community and, last but not least, financing. Figure 2 summarizes the characteristics discussed in the text in detail.

- *Application and selection*: If a professor wishes to recruit a new Ph.D. student then there are no clear and transparent rules for application in the traditional type. Often open positions are not announced in a public advertisement. The selection process is more like this: A professor knows a good student from her university and asks her if she wants to write her Ph.D. thesis at her chair. Or a student willing to write a dissertation asks a professor if she will supervise her.[9] Normally, the decision process is more or less opaque; the selection is informal and bilateral. So those job offers are seldom transparent to everyone from maybe Europe or even Germany being able to send an application. For the more structured programmes, there exist clear, transparent rules, and multiple criteria for application and selection of new Ph.D. candidates. Free offers are advertised so that interested students are informed when and where to send their application. Ph.D. candidates will be chosen from a formal application process if they win this kind of competition for the best brains. Probably, one will find more geographical diffusion among the participants of the structured programmes.
- *Matching***:** In the apprenticeship model the matching is akin to a personal invitation. The Ph.D. candidate is seen as a collaborator, a scholarship holder or as an external candidate. While in the structured programmes you have a wider pool from which to choose the most fitting persons to become your doctoral candidate or your supervisor. Often it is also possible to change your direct supervisor within the committee. So people get the time and the possibility to become acquainted with each other, thus finding the most preferable match for both sides. This also means that the Ph.D. students in the doctoral

[9] Berning/Falk, 2005, p. 56.

studies programmes play an active searching role within the matching process.

- *The relation supervisor and doctoral candidate*: The traditional German model means that you have a close and personal relationship to your supervisor. This can result in some difficulties if your supervisor is also your boss and displays a double dependency. In contrast, the doctoral studies programmes provide several supervisors[10] and so a Ph.D. student has more possibilities to get input for her thesis. If there are special research questions, she is free to ask the specialist within the supervisors' committee without be limited to her direct supervisor. The structured programmes facilitate scientific relationships within the doctoral students group. The collective structure gives the doctoral candidates the possibility to build up networks and to engage in conjoined research projects.
- *Integration into the scientific community***:** The German status quo normally means that your integration into the scientific community is very sparse. As money for the chairs is reduced there are often no possibilities to send people to conferences or to invite speakers. So shortages of governmental university financing show consequences if professors are not able to send their doctoral students to conferences for presentation of their research. In the structured programmes, you have your other colleagues, several professors, and there is money to send doctoral candidates to conferences, workshops or summer schools. The Ph.D. students have more possibilities for exchange and are normally more integrated into the scientific community. So doctoral students without an organized scientific setting are not as well promoted as those in the structured programmes.[11]
- *Financing*: Another point that will determine a successful Ph.D. education is financing. If a person does not know how to assure her means of subsistence then she cannot concentrate on writing her dissertation. As our focus of research is the doctorate for a career in academia we will exclude external Ph.D. candidates whose aim is normally not to become a researcher. The majority of Ph.D. students in the traditional German model are financed through a chair. So they are a collaborator and their supervisor is coevally their boss. For the doctoral candidates, this means a lot of external work duties like self-

[10] Berning/Falk, 2005, p. 50.

[11] Berning/Falk, 2005, p. 64; Berning/Falk, 2004, pp. 70 – 72.

governance or teaching obligations and less time for their thesis. Ph.D. students in structured programmes often receive a scholarship. Teaching is seen and used as a promotion instrument and not part of an employment contract.

*Figure 2: Characteristics of doctoral education*

| | German apprentice-ship-model | Structured doctoral studies programme |
|---|---|---|
| Application and selection | Informal | Formal rules |
| Matching | Personal invitation | Transparent, multiple criteria |
| Supervisor-relation | One to one | Several supervisors |
| Scientific community introduction | Sparse | Vast |
| Doctoral financing | Paid by chair, scholarship, external founding | Scholarship |

## Organizational Structures: Governance

We think that the organizational structures should be understood as important variables for explaining whether or not doctoral education meets international standards. Three identified sublevels will be analyzed. These are the university, the department, and the single professor. The differences between the two systems are influenced by the governance. Figure 3 shows the governance structure. In the traditional German system, the university is characterized by academic self-organization. At the department level all professors were formally equal to each other. The single professor was autonomous with his own chair, his own money for this chair and assistants working only for him.

The ideas of New Public Management let us expect that universities with structured programmes will have a management organization. And, as there will be managers, the department will be hierarchic with the professors embedded in the system and with less autonomy.

*Figure 3: Governance structure*

| Organisational level | German studies programmes | Structured doctoral traditional model |
|---|---|---|
| University | Academic self-organization | Managerial system |
| Department | Collegial system | Hierarchic |
| Professor | Autonomous | Embedded in collegial system |

## An Example for Performance: Publication

In the previous sections we discussed how doctoral training is organized in Germany. We showed the traditional German way to receive a Ph.D. and termed it the apprenticeship model. The proceeding development of science towards a global community smears the national boundaries and necessitates answers to face these challenges. The Bologna Process and the ideas of New Public Management are the European attempt to encounter the changes and needs in academia. At the moment, the two models of educating early stage researchers coexist in Germany – dominated by the apprenticeship model.[12]

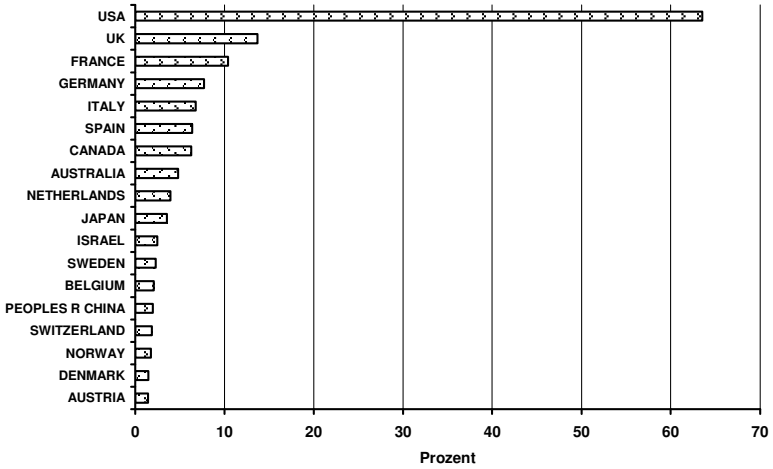
Now the question of interest is: Which model can be expected to be more successful in promoting research? Success will be measured in terms of performance. As one variable and example for scientific performance, we will present international publication data for the field of microeconomics. ECONLIT is used as data source[13]. Figure 4 shows that the USA dominate the worldwide publication market. In the year 2003, Germany takes in the fourth place behind the USA, the UK and France. The US-proportion is very high with 63 percent and the UK is placed as second, which may be explained in part by a language bias. But this argument of the language bias cannot tell the whole story, as France has more publications than Germany. In ECONLIT, overall France was behind Ger-

[12] Berning/Falk, 2005, pp. 54 – 55.

[13] The results shown in figure 4 were produced for the research project "Organizational determinants for successfully promoting new generations of researchers with graduate programmes: an institutional-economic analysis" within the research group "International Competitiveness and Innovative Capacity of Universities and Research Organizations – New Forms of Governance". For more details of the microeconomics study see Thaller, 2005.

many in 1990, but strengthened its position by 1999.[14] In the USA, Ph.D. students are educated in structured programmes. So maybe a more structured way of promo-ting young researchers would be a way to increase scientific performance internationally.

*Figure 4: Most important countries with microeconomic publications, 2003*




Source: ECONLIT, inquiry and calculations, Fraunhofer ISI.

## Preliminary Results

### Characteristics

The presentation of the results will be organized as a comparison between the apprenticeship approach and the more structured programmes. Due to restrictions in space, we can show only a selection of our findings. The order of the characteristics discussed in the theoretical part of this paper will be retained. Our

[14] EC, 2004, p. 22.

results are based on internet inquiry, questionnaires and interviews with professors of different departments.

We found that the application and selection process is more transparent in the structured programmes as compared to the traditional approach. There are strict rules of application with a fixed deadline. Candidates are not only required to meet the standards of the discipline but also to demonstrate their language skills; especially English is desired in an international scientific environment. Often, the whole team of supervisors decides which candidates will be chosen and only those meeting the standards of the program will receive an offer.

The doctoral candidates of the structured programmes get the possibility to choose their best fitting supervisor among the supervisors' committee. The matching is not fixed from the beginning of the doctoral education like it is in the apprenticeship model. To change your supervisor in the traditional model is much more complicated and difficult than in the doctoral studies programmes. The supervisors engaging themselves in structured programmes are highly interested in educating the next generation of successful researchers. So it is their aim to consider the candidates' interests instead of getting cheap work force.

Even in the doctoral studies programmes the relationship between the supervisor finally chosen and the doctoral candidate is allowed to be one-to-one. But if there emerge any problems then the candidates can be sure to get support from the program speaker. So mechanisms are established within the system to solve problems if they arise. What should be mentioned is that the Ph.D. students are not involved in the chair's daily teaching and self-administration work and so they are exposed to less conflict potential than the doctoral candidates from the apprenticeship model.

We found that Ph.D. candidates have more possibilities for exchange in structured doctoral programmes. They have the other candidates, they have many supervisors and they are more often sent to conferences and workshops to introduce themselves to the scientific community. The doctoral studies programmes are arranged with a better resource setting to foster recognition of Ph.D. students' research by other scholars. The supervisors of the apprenticeship model seldom have the financial resources to send their doctoral students to conferences or to invite other scholars for scientific exchange. So, if presentations at conferences are one criterion for a successful application for a position as professor

afterwards then the Ph.D.s in a structured program will have more chances to become successful scientists than those from the traditional German model.

Last but not least, we compared the financing of Ph.D. students for the two different ways of educating doctoral candidates. The majority of doctoral students worked in a traditional position at a chair. Teaching and self-administration are their daily work duties. In economics, it is common that doctoral students get a full offer if they are working at a chair. And this amount of money is more than the regular scholarship.[15] But the scholarship holder has no work duties and can use her whole time for her own research. So, a scholarship means less money for an economist but also less teaching and other work. The professors we interviewed see the financing by scholarship as a way to shorten the duration of the doctoral phase as people can concentrate on their research.

## Governance

As the intention of the current reforms is to change the governance of academia from the status quo to New Public Management, we wanted to know if differences exist in reality. Therefore, we compared the two models of educating doctoral students, namely the German traditional model and the structured doctoral studies programmes at three organizational levels of investigation: university, department and the single professor. We investigated whether academic self-organization, a collegial system at the department level, and autonomous professors are just attributes of the traditional status quo model, and whether a managerial system, departments with a hierarchic structure, and professors embedded in a collegial system are criteria of the structured programmes. So we wanted to know if structured programmes for Ph.D. students are in fact associated with the ideas of New Public Management. Have the institutions implemented elements of the New Public Management?

The question at the university level is: Do the levers of New Public Management lead towards a more managerially oriented system? At this stage of our research we can say that those elements – like financial incentives – have not introduced a management university. It was not due to financial incentives etc.

[15] This amount of monthly payment is mostly oriented to the scholarship's level provided by the German Research Foundation and is around EUR 1,000 per month.

whether or not a university had decided to implement a more managerial structure.

At the department level, a structured doctoral program does not lead automatically to a hierarchical organization of the department with a formal leader. We did not find a strong dean, but instead a collegial system with people working for the department's reputation. But as you need someone who leads the graduate school, one person who feels responsible, you will find informal leaders who are accepted by the entire group.

So what to say about the professors? The advocates of New Public Management believe in the idea of financial incentives. And so there exists a model to give a prize for every finished Ph.D. education. But such a scheme just rewards the quantity of output rather than the quality. We found that those financial incentives are not important for professors. For successfully promoting young researchers professors do not need extra money that is added to their wage, but personal initiative. You need people who act like entrepreneurs and not like free riders. The policy makers should think about scientific reputation and not about money, if they want to speak about incentives.

We can summarize our results as follows: In Germany most doctoral candidates are not educated in structured programmes, and are therefore subject to difficulties like fewer introductions into the scientific community. The more structured programmes try to face these problems. We found that the governance system is more a mixture of status quo and New Public Management than a pure type of the latter. Departments are not organized in a hierarchic way, and the professors' engagement for doctoral education is not influenced by personal financial incentives.

## Discussion

Our focus was on doctoral education for academic careers and in this connection influencing factors should be examined closely. We looked at public policies, institutional structures within universities and the different types and structures of doctoral education in order to assess the divergent academic outcomes. The

problem to face is that though these particular dimensions can be separated on a theoretic and analytic level, they are in fact highly interwoven.

In Germany, two major approaches of doctoral training exist. The most prominent is the traditional apprenticeship model, in which the supervisor guides the tenderfoot on his stony path of scientific work. The so-called "status quo" contributes to an individualized promotion of early stage researchers whereas parameters such as stress of competition and external governance remain disregarded. The second approach of doctoral education can be outlined as structured doctoral studies programmes with defined obligatory courses before or parallel to writing the Ph.D. thesis. This model of education is a more managed one and is therefore closer to New Public Management ideas than the traditional German model. Due to financial and political pressure, the lawmaker is searching for ways to sustain or even enhance scientific research without increasing costs but rather by decreasing spending. Therefore, politics encourage more and more diverse organizational units to enter a contest for public money to carry out research activities or even to expand.

With our research we want to explore which circumstances and which oganizational elements are more appropriate for fostering successful scientific research during the period of doctoral education. Our model includes several analytical levels which are presented in this paper. Even though policy programmes have been established to stimulate the development of more effective doctoral education, the traditional single-supervised Ph.D. education still dominates in Germany.

During our ongoing research project, we will look more closely at the determinants for successfully promoting new generations of researchers. We will enlarge our analysis to European institutions to avoid our results being limited to Germany. Europe tries to overcome many challenges with the Bologna Process to become a knowledge community with a worldwide reputation. We hope that our analysis will contribute some results that will foster internationally successful doctoral education.

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# Contributors

Gabriele GORZKA: Since 1994 Director of the East-West-Science Centre at the University of Kassel. Master degree in slavonic studies and a Ph.D. degree from the University of Marburg; 1978 – 1990 research associate at the Centre of Higher Education and Work, University of Kassel; 1990 – 1994 vice-president of the University of Kassel. Numerous publications on Russian cultural history and higher education issues in Eastern Europe.

Vadim B. KASEVICH: Vice-rector for educational policy and curriculum at the State University of St. Petersburg and head of the department for studies in theory and methods for arts and humanities. M.A. and Ph.D. degree from the University of Leningrad. University professor since 1982; author of more than 250 scholarly publications.

Barbara KEHM: Since 2004 Director of the Centre for Research on Higher Education and Work at the University of Kassel. Degree in german studies, history and philosophy and Ph.D. degree from the Ruhr-Universität Bochum. Research assistant at the Ruhr-Universität Bochum; 1990 – 1995 research associate at the Centre for Research on Higher Education and Work, University of Kassel, 1995 – 1996 at the Society for Empirical Studies, Kassel, and 1996 – 2003 at the Martin-Luther-University Halle-Wittenberg.

Evgeny A. KNYAZEV: Head of the Scientific Laboratory of Modeling Institutional Subjects and Processes of the Research Institute of Mechanics and Mathematics, Kazan State University, and Deputy Director of the National Centre for Educational Reforms, Moscow. 1991 – 2002 Head of International Office and Vice-Rector for International Relations at Kazan State University; 1998 –

2003 Head of the Department of Economical Cybernetics at Kazan State University; Expert in higher education management problems at the National Training Foundation, Eurasia Foundation, and The Universities Project by Salzburg Seminar. Member of the editorial board of "The University Management: Practice and Analysis" and "Higher Education in Europe". Author of 40 publications on strategic university management and international cooperation, including five group monographs.

Ute LANZENDORF: Since 2005 Deputy Director of the Centre for Research on Higher Education and Work at the University of Kassel. Graduate in geography at the University of Hannover and a Ph.D. degree from the Johann Wolfgang Goethe-Universität Frankfurt. 1995 – 2000 research associate at the German Institute for International Educational Research in Frankfurt/M.; 2001 at the German Rectors' Conference; since 2002 research associate at the Centre for Research on Higher Education and Work, University of Kassel.

Sergey F. PODLESNY: Rector of Krasnoyarsk Technical University. 1965 degree from the Krasnoyarsk Polytechnic Institute; research and teaching in the field of radio technology; head of the UNESCO Chair "New Materials and Technologies"; head of the Krasnoyarsk regional department of the Russian Academy of Sciences; research manager of the Krasnoyarsk Regional Centre for Research on Quality Assurance in Education. Author of about 190 publications.

Max REINHARDT: Ph.D.-student in political science at the University of Hannover and fellowship holder of the Friedrich-Ebert Foundation. President of THESIS – the German interdisciplinary network of young scientists.

Michael SCHLICHT: Head of the Division for Bilateral Co-operation with Russia, Ukraine and other CIS Countries, Federal Ministry for Education and Research; extensive stays in Central and Eastern Europe; 1996 – 2000 head of a foreign aid project in Africa; until 2004 head of the Division for Global International Strategies in Education and Research and Co-operation with Multilateral Institutions.

Ulrich TEICHLER: Since 1978 professor at the University of Kassel and until 2004 Director of the Centre for Research on Higher Education and Work. 1968 – 1978 research associate at the Max Planck Institute for Educational Research in Berlin ; 1980 – 1982 vice-president of the University of Kassel; part-time professor of education and social policy at Northwestern University, Evanston/Illinois (1986 – 1992) and at the College of Europe, Brugge/ Belgium (1994 – 96). Research fellowships, guest professorships, etc. in Argentina, Austria, Finland, Japan, the Netherlands, and the U.S.

Nicole THALLER: Researcher at the Institute of Labour Law and Industrial Relations in the EC (IAAEG) in Trier. Master degree in sociology, economics and pedagogics in Bonn; 2002 researcher at the University of Bonn (2002) and 2003 – 2004 at the Central Archive (ZA) in Cologne.

Vladimir TROYAN: Since 1993 Vice-rector for research of the State University of St. Petersburg. Graduation, Ph.D. and Dr.Sci. degree from the Leningrad State University. 1968 – 1972 assistant professor, 1972 – 1980 senior researcher, 1980 – 1989 full professor. Since 1989 head of the department of physics. Visiting professor at numerous universities world-wide, member of the Russian Academy of Natural Sciences; member of the Council on Science and Education of the Russian Parliament; chairman of the Council of the St. Petersburg Programme for Support of Talented Young Scientists.