Per aspera ad astra? The formative years of scholars

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Profound changes in recent years

Experts agree that the stages of scholars’ careers between the first degree and the appointment to a professorship or a similar senior research position have undergone profound changes in Europe in the recent past and are likely to experience further changes in the future. The following paragraphs deal with the most common changes.

First, we have observed a substantial growth in the number of both doctoral candidates and doctorate degrees awarded. It is generally assumed that the demand for scholars in higher education and research institutes, and for researchers in industry is on the rise and that the European Commission’s ambitious goal of creating a European Research Area in which, by 2010, 3% of the Growth Domestic Product will be spent on research could lead to a further rise beyond the general trends. Although the statistics on the overall number of researchers in Europe are incomplete and not suitable to make firm conclusions about the human resources demand of the research sector, most experts notice a greater rise in the number of doctorates awarded than in the job opportunities in higher education and research. In many countries, the rise in the number of doctoral awards was called for in order to increase the proportion of those with this qualification turning to employment outside the higher education and the research sector. Obviously, the number of positions outside the research sector grows in the development of a knowledge society in which advanced academic competences are valuable for complex problem-solving tasks.

Secondly, in Europe there has been a rise in those activities that systematize and institutionalize doctoral studies in the framework of graduate schools or other arrangements. This might imply new forms of teaching and learning during this stage, changing supervision and increasing interaction between various doctoral candidates. As a result, the pure apprenticeship mode of the doctoral phase has lost backing. In some countries, the trend towards larger numbers of doctoral studies, together with more systematic modes of instruction, led to an increase in the number of doctoral candidates without financial support for the doctoral phase and possibly with tuition fees to be paid.

Thirdly, the continued trend towards specialization in research affects the function of the dissertation in the overall research system. Doctoral candidates more often became specialists whose knowledge acquired in this process might be more highly appreciated as a unique area of expertise, it but might also be
too specialized to cover a substantial range of necessary competences in the next
career stage.

Fourthly, academic careers seem to become more risky in many countries
and many sectors. Between the ages of about 30 and 40 years, when those in other
careers are settling, there tends to be a high degree of uncertainty and selectivity
in academic careers. Senior co-ordinating positions are limited. Many researchers
who were not promoted to senior positions are phased out of research positions
because it is widely assumed that innovation in research can be served better
by new graduates than by those in mid-career who are continuing professional
training. Fixed-term contracts for researchers in their 30s are also a widespread
practice because the required competences for senior positions are more likely to
be noticed in mid-career, rather than earlier. With the increasing numbers working
as research ‘workers’ in the early career stage, with more post-doc positions being
seen as an additional careers stages carrying higher risks as far as long-term careers
are concerned and with a general increase of fixed-term employment in the labour
force, concern is growing that academic careers might lose their attractiveness and
that talented individuals might opt for other careers.

Fifthly, international mobility of young researchers during their
formative years is becoming a more common practice. This is interpreted as
creative experience for young scholars. The European Commission, for example,
supports Marie Curie fellows, and many European countries provide funds for
the mobility of young scholars. This can both enhance the competences of these
scholars and benefit the higher education and research institutions which get fresh
ideas from visiting foreign scholars and from returning native scholars. However,
there is widespread concern of a brain drain, for example from Central and Eastern
European countries to Western Europe or from all European countries to the
USA, i.e. a mobility which, in the end, turns out to be a loss to the country where
the scholars were initially trained.

These changes seem to be, to a considerable extent, common features
across disciplines, types of institutions and countries in Europe. However, if
detailed information is provided, even experts in the field of higher education are
surprised to learn about the diversity of conditions and the underlying problems,
but also about successful measures to shape these career stages.

Career stages

In most professional areas, university graduates might undergo a period of initial
training, possibly up to 3 years, after graduation and these few years tend to be
characterized by a mix of learning and productive work. Thereafter, they are
assumed to be fully qualified professionals who might acquire new knowledge as
part of their productive professional assignments. In academic careers, however,
we notice long periods of mixing subsequent learning with productive work. The
emergence of a separate post-doc stage in recent decades between the doctoral
phase and middle-level academic positions underscores the long and complex
time-span between initial graduation and obtaining well-established positions in
higher education and research.
Practices vary between countries as to how the various stages of academic careers are defined officially with respect to learning and productive work. This might be reflected in their status as students, doctoral candidates or research workers involved in doctoral work, their financial condition, regulation of supervision and levels of degrees. For example, the existence of a ‘Habilitation’ or other advanced doctorates in some countries underscores that competence acquisition is viewed as a crucial definition of the job role up to the transfer to a senior academic position. When comparing at an international level, we can define the period from the first degree up to senior academic position as a sequence of career stages mixed to different degrees by expectations of advanced training and learning and of productive academic work. The title of this book, *The Formative Years of Scholars*, was coined to direct attention to this mix of functions over a long period in life. Certainly, however, it is worth observing the different mixes by country, discipline and institution.

**The knowledge base on academic careers and the function of dialogue between various experts**

Knowledge about the formative years of scholars tends to be compartmentalized. Little is known about common elements and divergences between young scholars in higher education institutions, public research institutes and industry. Generalizations are often inappropriate across disciplines. Higher education researchers and science researchers have undertaken systematic studies on academic careers, but practitioners and policy makers have not given these studies widespread attention. More information is needed about the practitioners’ views. In some respects, the conditions for the formative years of scholars differ so dramatically between countries that many generalizations are misleading. Last, but not least, many national and European agencies are segmented according to responsibilities for higher education and other research sectors — a fact that not only creates knowledge gaps but inconsistent policies that pertain to the formative years of scholars.

This volume draws from efforts of the Academia Europaea to improve communication between the various actors. The aim of the conference was to take stock of the available knowledge of the:

- interaction between formation of competences and productive research work;
- opportunities and constraints of study, working and employment conditions; and
- the impact of ‘Europeanization’ and internationalization on the formative years of scholars.

Beyond that, the conference aimed to stimulate new thoughts about ways to improve the quality of knowledge acquisition and generation as well as a satisfactory life stage for the scholars.
The contributions

Jens Fenstad, an experienced scholar in mathematics who has served many functions of science policy, provides an overview of the development of the various disciplines and thematic areas of research in science and engineering. He uses the major cross-disciplinary international journals that report on developments of the knowledge system in the conditions of these fields, i.e. Nature and Science, as the information base for his analysis. In drawing conclusions with respect to the formative years of scholars, he points out the conflict of training academics within a reasonable time-span and the growing demand for knowledge, understanding and even the building of a culture across traditional disciplinary boundaries.

Peter Scott, whose career has developed from being an expert journalist on higher education, via years as a professor specializing in higher education and science research, to a Vice Chancellor’s position, highlights two major trends affecting the academic profession. On the one hand, massification of higher education is often viewed as leading to a decline of the status of academics but also opens higher education for responsibilities beyond the ivory tower. On the other hand, the term ‘knowledge society’ addresses various different issues of knowledge production and utilization, but certainly points at more direct uses of systematic knowledge. The author considers the formative years of scholars as being most strongly affected by these general trends in various respects: a growing importance of (state) politics and/or markets in determining research priorities; an increasing emphasis on accountability; growing attention paid to dissemination of knowledge beyond traditional intra-academic dissemination; and the increasing expectation that scholars should be “performance managers and entrepreneurs, developers and disseminators”.

Raffaele Liberali, a key administrator in the European Commission’s Directorate General for Research, starts off from the Lisbon Strategy of 2000, which has been endorsed by the European Council to establish a European Research Area to make “Europe the most dynamic and competitive knowledge economy in the world by 2010” and to increase for this purpose the investment in research in the EU (European Union) member states to an average of 3% of the Gross Domestic Product. The Lisbon Strategy seemed to have been substantially less successful than expected at the halfway point in the process. However, he notes a consistent strategy to reinvigorate and refocus the strategy. He provides detailed information of four major paths for improving human resources in research and development:

- improving the overall environment for researchers in Europe by enhancing mobility and removing obstacles;
- increasing the European career perspectives for researchers and the attractiveness of a career in research;
- enhancing public recognition of the researchers’ roles and contributions to society and the welfare of citizens;
- providing more and systematic investments in researchers’ training, mobility and career development.
Indra Willms-Hoff, a key administrator of one of the major research foundations in Germany, who previously had been active in biochemistry research, underscores the role of research foundations to encourage both young and established researchers to cross disciplinary boundaries. Moreover, she shows that the research promotion programmes established in Germany by her own and other foundations put emphasis on ensuring independence and responsibility at an early stage in careers. Foundations have the flexibility of contributing to quality improvement and increasing independence of young researchers more strongly than the overall policies of higher education and research. Altogether, however, many ambitious goals of quality improvement in research are not likely to succeed if the overall funding of research is not increased substantially.

Bernd Wächter, the director of the agency that co-ordinates the co-operation between European national exchange promotion agencies, addresses the controversial debate about 'brain drain' out of Europe. He considers 'brain drain' to be a metaphor, rather than a fully fledged theory, that does not suggest any threshold up to which which mobility is normal and beneficial and beyond which it is viewed as a loss or a threat. A complete set of statistics is not available, but the major weakness of what is available is the emphasis on mobility at a certain point in careers, without any information of the movements over the course of careers. This inflates the impression of 'brain drain', as actually, the majority of young European scholars either intend to move or have moved to the USA on a temporary basis. In some disciplines, spending some time there seems to be almost a requirement. One could argue that most young scholars take into account the research conditions at certain institutions at certain stages of their career, rather than having a country or long-term mobility in mind.

Barbara M. Kehm, director of the German higher education research centre which places major emphasis on international comparison, underscores that the political moves towards a European Higher Education Area and a European Research Area have increased the interest in in-depth knowledge about the conditions of the formative years of scholars in various European countries. This enables comparison with the conditions in economically advanced countries outside Europe, notably the USA and Japan. In her presentation, she drew from three comparative studies undertaken by UNESCO’s European Centre for Higher Education, the European University Association and an institution in the USA. She concludes that the trend towards a stronger structuring of doctoral programmes is closely linked to the expectations that research undertaken by doctoral candidates is socially relevant and that a growing number of persons awarded a degree become professionally active outside the higher education and research sectors.

Janet Metcalfe bases in her report on her professional experience in a network, funded by the research councils of the UK, which aims to train university staff and supervisors to improve the quality of the professional development of young researchers. She also points out that the apprenticeship model is declining as a consequence of increasing numbers of doctoral candidates. In the UK, more than half of these move subsequently to professional work outside academia. In the UK, this trend is reinforced, in contrast with most other European countries, by the establishment of programmes for professional doctorates.

Jürgen Enders, director of the major institute of higher education research in The Netherlands, and Marc Kaulisch, a research associate at the same
institution, address the formative years of scholars in the overall framework of academic careers and in comparison with other professional careers. They argue that academic freedom, knowledge-based and peer-review-based decisions in the labour market, frequent external recruitment, self-management of careers, the strong role of networks and mentoring as well as the frequent use of alternative work arrangements can be viewed as characteristics of an “exceptionalism of academic careers”, primarily due to the needs of research-focused professional activities. These traditions of academic work still seem to have a strong impact on the academic career today, although conditions have changed substantially. On the one hand, academic careers associated with internal controls, the increasing power of the management of higher education and research institutions and an increasing role of in-house careers. On the other hand, the academic careers are more boundaryless than in the past due to the options of international mobility and due to the expectations of co-operation across the disciplinary divides. The authors attempt to characterize a common trend in various European countries, but eventually call for in-depth analysis of various countries because they might opt for different roles of higher education in the move towards the knowledge society.

Gunnar Öquist, scientist and key manager of the Royal Academy of Science in Stockholm, notes that the most dramatic change of academic activities is due to growing utilitarian expectations, although he also notes some counterbalancing activities. He points out four “vital requirements for a successful scientific career”:

- more and better co-operation among specialized researchers to address questions of increasing complexity;
- new generations of researchers with the ambition and skill to lead large, integrated research programmes and institutions;
- a new generation of scientists trained to discuss and argue the case of science and rational reasoning in a broader social context;
- better incentives for researchers to increase both their intellectual and geographical mobility.

He advocates increased leadership training as integral part of academic careers.

Göran Melin, a researcher at the major Swedish institute for educational and science research, and Kerstin Janson, a researcher at the major German institute for higher education research with a comparative emphasis, not only summarize the major thrusts of the presentations and subsequent discussions thereby referring to the key analytical literature in the domains addressed, they also develop the presented thoughts further in two respects. First, they underscore the broad range of competences required from persons awarded a doctoral degree by their future employers; notably, managerial skills, the ability to communicate with the public, the ability to connect with foreign colleagues in networks, the administration of projects, dealing with and understanding of political circumstances, negotiating with business partners, and cultural understanding. Secondly, they point out that the post-doctoral phase increasingly is viewed as the potentially most creative period in life, and that this is the stage of the academic career in which scholars move from a broad basis towards a high degree of specialization. The authors
are convinced that this important stage will not be characterized merely by both flexibility and uncertainty, but will require, in the long run, a more formalized and structured setting.

Altogether, the views presented vary as regards the best ways of making careers more attractive and research work to improve in quality during the formative years of scholars. But they agree in arguing that more structured programmes of doctoral training and possibly a clearer structure of the post-doctoral phase are inevitable. There is a need to prepare scholars who are already in their formative years for considerably more complex tasks, compared with what would have been required in the past. Learning to cope with a complex job role at advanced stages of one's career cannot be done with self learning anymore; instead one has to prepare young scholars to become highly skilled actors in research co-operation, research management, in communication with the public, and in targeted dissemination. Academic careers are on the move towards a professionalization beyond the core competences of teaching and research.