

**OUTCOMES OF THE
FIRST DOC-CAREERS WORKSHOP
La Fondation Universitaire, Brussels, 1st March 2007**

The first workshop addressed the degree of alignment between universities and industry in what is understood as transferable skills for PhD graduates. The DOC-CAREERS Steering Committee had identified the following key issues which should be addressed using examples of innovative doctoral programmes in three selected fields (Science, Engineering and Technology; Biotechnology/Medical/Life Sciences; Economics and Social Sciences):

- Links between doctoral programmes and research careers, that is, between PhD programmes and opportunities for researchers in the labour market (public and private)
- The employability of PhD graduates in industry, particularly taking account of non-academic employers' perspectives.

For each of the above selected areas of study the following questions were addressed concerning doctoral training for non-academic careers:

- Where do we need PhDs? What are the different career paths of a researcher?
- What makes a PhD holder employable? What are the skills and competencies which are valued by employers? Are PhD programmes providing these skills and competences?
- Are PhD holders aware of their skills and competences? Can they convey them appropriately to potential employers?
- How to raise the profile of the research career in Europe?
- How mobility between university and industry can enhance the research career? How feasible is inter-sectoral mobility in building a successful research career?

To address these questions 26 professionals from 13 countries, from academia, professional organisations, government and industry participated. There were 9 representatives from university or university networks, 11 representatives from professional bodies, 3 from government bodies and 3 from corporative companies with strong research activity.

The two initial presentations of the programme, the first on general issues concerning recent developments in PhD programmes and the second on key governmental figures showing main data on PhD holders and labour market, contributed to set the scene for subsequent discussions, which took place in two parts. The first part was a plenary discussion where participants were invited to give general input on the five questions mentioned above. In the second part, participants split in 3 groups to deepen the discussion on specific characteristics related to each of the three fields of study to identify skills needed for PhD holders in non-academic careers, models of PhD career paths and factors needed to enhance the profile and attractiveness of PhD based careers.

Outcomes of the plenary discussion:

Participants agreed on the basic concerns related to the acquisition of transferable skills in PhD, its awareness by the PhD holders and employers and the links with the employability of graduates in non-academic careers:

Transferable skills are “learnt by doing”, they can not be mastered by only taking courses, and an appropriate level of their development has to be ensured at all degrees of education. PhD education provides a special framework to carry out an original piece of work, the PhD thesis, which allows the development of a set of transferable skills that are otherwise difficult to acquire and master.

Universities have great interest in providing education programmes with high standards of quality to ensure their prestige as institutions and retain or attract high a level labour force. Employers in non-academic sectors need PhD in high level positions where, in addition of technical knowledge, bring alongside a set of transferable skills suitable for successful development of their work.

As a framework for the subsequent discussion in specific fields, the following key issues were identified:

- Transferable skills are directly linked to the employability of PhD holders for both academic and non-academic careers. The skills needed depend on the type of position but amongst others, interpersonal skills and analytical thinking are thought to be the most valued by employers.
- PhD candidates, PhD holders and employers should have a higher degree of awareness of the transferable skills that are acquired during the elaboration of their PhD thesis.
- There are a number of good practices already in place to help to develop transferable skills and its awareness during the PhD work (e.g. individual career development guidance/management, budget responsibility).

- PhD programmes should offer (not impose) a positive environment to develop transferable skills for both academic and non-academic careers.
- PhD programmes should raise awareness of embedded transferable skills to be acquired during PhD period without over-regulating, over-monitoring and over-charging the programmes.
- PhD programmes should provide a common core of processes and outcomes but respect diversity and provide individualised training to help PhD candidates to develop best their capabilities.

- A number of structural and cultural reasons lead to a communication gap between academic and non-academic worlds (e.g. the difference in the concept of time).
- Non-academic employers should, in general, become more aware of transferable skills that PhD graduates develop.
- Dialogue between academia and employers should be strengthened. There are a number of good practices already in place in several European universities, such as joint supervision, job fairs, workshops, and, in some countries, government incentives for companies to hire PhD holders or part time university professors.
- In relation to including industry in PhD programmes it should be avoided that the university become an extension of the work of industry.

Outcomes of the Parallel Working Group on Science, Engineering and Technology:

Skills which make a PhD holder in Science, Engineering and Technology more employable:

- Communication
 - Evidence-based influencing people
 - Oral skills for a broad frameworks of audiences (interdisciplinary teams, conferences – science, society, scientific/technical workshops, ...)
 - Ability to communicate with people with different levels of education
- Acquiring and processing information
- Synthesising knowledge
- Integrating knowledge from different disciplines
- Leadership: teamwork, dealing with uncertainty, conflict handling
- Failure management
- Commercial awareness (market, IPR)
- Research Management
- Creative thinking (discovery, imagining solutions)
- Negotiation
- Understanding of business environment
- User requirement consciousness

Employers' perspective:

- Required Skills depend on job position vacancy
- Employer needs to see a glance of skills needed for the job position. If a candidate does not have acceptable level of certain skills but detect the capacity s/he to acquire it, they can provide necessary means to develop it.

Actions to raise the profile of PhD holder careers in non-academic sectors:

- Field visits to industry/enterprises
- Industry/Enterprise presentations in academic environments showing “typical dilemma” examples in non-academic environments.
- Lectures from industry
- Favour part-time positions sharing academic and non-academic environments.
- Establish projects with industry partners
- Joint university-industry supervision of PhD candidates, caring about the risks of employing “cheap” labour force for high quality outcome.
- Design joint university-industry programmes able to show the added value of research
- Work on a case-to-case basis, not structured, caring about legal issues

General comments:

- Generic training on transferable skills is needed
- PhD should be offered preparation for both academic and non-academic careers right from the beginning of their PhD work.

Outcomes of the Parallel Working Group on Biotechnology, Medical and Life Sciences:

Characteristics of PhD training

Team work was felt to be the strength/modus operandi of working in these disciplines/fields.

PhD candidates have a “9 to 5 job” – they are in the laboratory. Their supervisors know where there are and there is more frequent access and dialogue.

PhD candidates in these fields are more likely to be given a thesis topic (but the best candidates come back to challenge the choice of the topic within 6 months).

The emphasis is on team management rather than being managers in a leadership sense.

Are these characteristics equally important to academic and industrial environments?

In both environments inter-personal skills are important particularly with respect to working under pressure, and coping with conflicting demands.

Team leadership skills are also equally valued in both environments.

Employers want an “awareness” in PhD candidates of what skills will advance your career.

Project management skills are an overriding need and concern.

Only a small proportion of scientists can expect to rise through the ranks of top management.

Are there needs for dual training/partnership in the biosciences?

Overall consensus on this point – there was a clear need for “exposure” to the outside (non-academic) environment.

Career Opportunities NOT Career Paths

Even in the most successful universities in terms of collaboration with industry/business enterprises, intersectoral mobility is not seen as a main outcome. Industry wants simply to recruit the best scientists and retain them.

What is needed more – is to bring alumni (based in industry) back to the university to give lectures, some supervision and to promote their experience of a career in the private sector.

How to raise the profile of the research career in these fields?

The need for an enhanced “Science-Society” dialogue – to create greater understanding of the potential benefits of the research, while recognising and weighing-up risks.

This does not imply simplifying the science for public consumption because academic colleagues will subject you to criticism.

The case for a professional body for the life sciences to take the “Science-Society” dialogue seriously.

Conclusion: Transferable skills should be focused on developing creativity (both in original research and its awareness of its impact and the societal dimension).

Outcomes of the Parallel Working Group on Social Sciences and Economics:

What skills make a graduate of social sciences and economics more employable?

- analytical skills
- methodological knowledge and skills
- communication and presentation skills
- management skills
- international, intercultural experience and competence working in such environment
- language skills
- people and relationship management skills
- computer science skills
- hard science knowledge (to a certain degree) – eg statistics
- interdisciplinary skills and knowledge – broader picture and understanding of the world
- entrepreneurship
- social skills in different context (in different socio-economic environments)
- creative thinking, innovation (thinking out of box) – new ideas beyond disciplines
- ethics
- problem solving
- fundraising

After an in-depth discussion the WG came to a conclusion that these skills are important both in “soft” and “hard” sciences and there is not much difference between the needs in various sciences and environments. The group said the same about the academic and business environments – all above mentioned skills are needed in some way in both environments.

What is it that makes a PhD holder different from other graduates and why would industry want to employ him/her?

PhD holder has deeper analytical skills, large stamina – long-term dedication to finish what s/he started (to complete the project from the beginning to the end), creative and innovative thinking, s/he is ready to work hard, has original thinking.

Mobility between sectors:

It remains an important topic and a “must” – academics have to have at least some contact with the outside world (at least some cooperation; there are also placement programmes for that). The reality, however, is that this mobility is easier at the younger age, but later in your career you do not want to take so much risk and want to keep a stable career and job.

General Remarks of all Working Groups:

Generic training and raising of awareness on transferable skills is needed. There seems to be a consensus on the core competences of PhD holder, and those are quite independent of the field of study. Main core competences include social skills, creative thinking, capacity of dealing with complex and multidisciplinary work and team work. Management skills are also important but they are usually needed at later stages of careers.

Concerning typical career paths, the impression is that there is a huge diversity. Some large companies do have career paths that a PhD candidate can encounter as he/she develops his/her career within the company.