

Science Europe Working Group
Research Careers

Workshop on Inter-sectoral Mobilityⁱ

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Introduction

Programmes for researchers' doctoral and postdoctoral training in Europe demonstrate an increasing interest for inter-sectoral mobility.

A useful definition of inter-sectoral mobility is provided by MORE-2¹: "Inter-sectoral mobility is defined as being mobile to a sector outside academia, in the researcher's own country or abroad. This not only relates to private industry but also to the private not-for-profit sector as well as the public and government sectors."

Short-time placements of three to six months in a non-academic environment or joint doctorates with industry are more and more common. This is due to the fact that such experience broadens researchers' career perspectives and stimulates innovation and transfer of knowledge. Given that an estimated 50% of researchers will work in jobs outside academia once they finish their doctorates, they need additional skills which are not necessarily acquired during the training or research period at higher education or public research institutions. Industry, for example, seems to value social and behavioural skills, such as leadership, team work abilities or entrepreneurship, but also specific skills such as Intellectual Property (IP), which have also become more relevant in academia.

The Science Europe Working Group on Research Careers wishes to address the issue of inter-sectoral mobility in view of formulating policy recommendations to Science Europe Member Organisations.

¹ www.more-2.eu

There are many initiatives in support of researchers' mobility and career development. Duplication of efforts should be avoided and existing and ongoing initiatives should be taken into account when formulating new recommendations².

This is why the Research Careers Working Group organised a workshop to bring together experts in the field to discuss achievements and analyse needs for further action. While the main content of the workshop was on inter-sectoral mobility and joint doctorates between industry and academia, other forms of public-private sector collaborations of researchers were also addressed if considered relevant in the context of researcher careers.

Summary of findings from workshop presentations

1. The results of EU's MORE-2 Project – by Iain Cameron, Research Councils UK and Chair of Science Europe Research Careers Working Group

According to the MORE-2 results, 23% of European researchers have been mobile across sectors (> 3 months) during their PhD and 30% at post-PhD stage, of which 12% in private industry, and only 3% in a dual position between private industry and a Higher Education Institution. Researchers who are currently in a dual position (academia and private industry) indicate that they are relatively more satisfied with opportunities for advancement, remuneration, social status, mobility perspectives, dynamism and independence in their current industry post than in their current academic one. On the other hand, the academic position is evaluated more favourably with respect to job security, job location, employer, intellectual challenge and degree of independence. Researchers tend to value the type of work more than the level of remuneration when choosing a position; moves to non-academia tend to take place early in a career: university researchers are less likely to move to non-academic research positions the older they are or - more precisely - the longer they have been working at a university.

2. DOC-CAREERS Project – by Lidia Borrell, European University Association (EUA)

The DOC-CAREERS³ project analysed in particular collaborative doctoral education between industry and academia, and has formulated its findings in the following key messages for collaborative doctoral programmes:

Keys to success for researchers for collaborative doctoral programmes between industry and academia:

- Identify knowledge and technological needs and challenges which need R&D input
- Exchange views on knowledge/technological challenges with university/industry
- Plan medium-long term R&D strategy (e.g. within five years)
- Develop high-quality research proposals
- Know the costs of your research and identify funding sources

² Initiatives include the EUA Doc-Careers project, the MORE studies, as well as the EU's Steering Group on Human Resources' Working Group on Innovative Doctoral Training, that were discussed at the workshop, but also a lot of initiatives at national levels.

³ <http://www.eua.be/eua-work-and-policy-area/research-and-innovation/doctoral-education/doc-careers/>

- Raise awareness of the respective research environments in which to collaborate in your field (university, industry)
- Develop 'soft' ways of interaction between students, researchers and industry experts with good research content (conferences, fairs, etc.)
- Organise small-size highly-specialised workshops pooling experts from different research fields and sectors
- Seek the right expertise to assist you (IPR issues, contractual issues, etc.)
- Formalise doctoral collaborations in solid and fair agreements combining structure and flexibility
- Consider physical proximity as an asset to develop mutual trust - promote face-to-face dialogue
- Commit to excellence in doctoral education, research and management

3. The National Science Foundation (NSF) – US Experience –by Carmen Huber, NSF

Compared to Europe, the situation in the US is characterised by a more regular interaction of universities with industry.

- Only three quarters of a professor's salary is covered by the employing university, another quarter is funded through other grants, including contract research with industry.
- 30% of the top research universities in the US are private, which decreases administrative barriers for outside partnerships.
- Even for public universities, public funds to top research universities range under 20%, while a large part of income stems from industry and endowments.

NSF has both missions: research and education; PhD training is considered specifically under the educational strand of NSF activities. For all NSF projects, two selection criteria are relevant for decision making, i.e. intellectual merit and broader impact.

When considering PhD training, a criterion of broader impact is certainly the employability of PhD holders. In the US, the time to obtain a PhD degree is in average six to seven years, while it is around three to four years in Europe for most disciplines.

Like in Europe, non-academic employers in the US find PhD holders lack certain skills. While they are very good in technical in-depth knowledge in their field, they should be more proficient in business related skills, including IP.

The NSF has a lot of experience with funding schemes to support inter-sectoral mobility or public-private sector collaborations. The funding schemes typically address one or several structural weaknesses in the system and are limited in time, often lasting an average of ten years. A detailed overview is found in the presentation available on the NSF website⁴. Unfortunately, for most of these schemes, an impact analysis has not been done so far.

4. The Labour Market and Researcher 'Career Portfolios' – by Rosa Fernandez, UK National Centre for Universities and Business

The presentation underlined the many facets of inter-sectoral mobility and the difficulty of assessing their impact.

⁴ <http://www.nsf.gov/>

- High level and technical human capital matter for economic growth.
- Companies are looking for highly qualified people.
- The exchange of knowledge embodied in people moving in and out of academia is crucial.
- Destinations of postgraduates by subject are more varied than those of undergraduates.
- International mobility and collaboration improve research performance, but is this the case as well for inter-sectoral mobility?

There is a need to better understand the impact of inter-sectoral mobility on both, researcher careers and industry-academia interaction and performance.

5. A Competency Approach: the ADOC Career Project – by Barthélemy Durette, ADOC Talent Management, France

ADOC Talent Management was founded in 2008 by two PhD holders. It has recently carried out a large-scale online survey collecting around 4500 replies by PhD holders and employers, with the aim to compare doctorate holders' competences and labour market needs.

Some findings by ADOC:

- A large variety of organisations show an interest to hire PhD holders.
- The world moves fast, globalisation brings along growing complexity, international competition, and the need for technology development at an ever faster speed.
- Companies need collaborators who are ready to address societal and market needs, and who can innovate and imagine tomorrow's solutions, technologies and strategies.
- PhD holders have the potential and the opportunity to occupy many positions in the private sector, including outside R&D. These careers are not only possible thanks to the doctoral degree, but thanks as well to the skills developed by the PhD holders.
- Technical skills are the first reason to recruit a PhD holder but personal abilities such as reliability and social skills are highly valued by recruiters and play an important role that PhDs and advisors tend to underestimate. The combination of very good technical and cognitive skills with innovative thinking and social skills are therefore essential for a successful career.

Preliminary Workshop Conclusions

While more than half of future PhD holders in Europe will have to find jobs outside academia, they may not always be well prepared for this move. Raising awareness about skills needed in the non-academic sector is therefore essential during the doctoral and postdoctoral phases to broaden career perspectives of researchers and prepare them well for the labour market. The US has a longer experience with industry-academia interaction and European researchers might learn from this experience.

The workshop discussions resulted in the **following recommendations to the Research Careers Working Group** that may be further explored by Science Europe:

- Recognise the importance of inter-sectoral mobility to broaden career opportunities for researchers.
- Support periods of short-term stays (3-6 months) of researchers in an industrial or non-academic context, by making it an option in each research project (including doctoral

programmes) rather than an obligation; a clear advantage of inter-sectoral mobility is to better understand the skills that companies expect and changing the self-awareness of competences.

- Prepare researchers to a labour market outside academia by systematically covering so-called 'T skills' in doctoral programmes – where the vertical line stands for in-depth technical knowhow, and the horizontal line for the broader transferable skills.
- Raise awareness of opportunities for PhDs to create their own jobs through interaction with companies setting up innovative projects that require specialised skills not necessarily available in the company.
- Include options for arts and humanities' disciplines and broaden mobility opportunities to the non-academic governmental or non-governmental sectors.
- Contribute to the development of regional clusters around university-industry collaborations in strategically relevant domains, using the strengths of the region and of the actors (see as well the EU's Smart Regions' concept).
- Select the right people on both sides – university and industry: more open minded academics and less short-sighted business people.
- Compose selection committees carefully in order to be able to assess quality on both sides.
- Ensure scientific quality control in order to avoid funding technology transfer instead of research, to account for tax payers' money.
- Stimulate interdisciplinary topics dealt with by inter-sectoral research teams to enhance research driven responses to future socio-economic challenges.
- Look for sound evidence of impact of inter-sectoral mobility; analyse for example the potential relationship between inter-sectoral mobility and the innovation index of a country.
- Support data collection on career paths of PhD holders so as to gain a better understanding of inter-sectoral mobility on careers.
- Promote data collection, such as the continuation of the MORE Studies; in view of MORE-3, the WG on Research Careers is ready to collaborate with the EU and give feedback on the methodology and the questionnaire; EURODOC raised the concern that the MORE-2 study only considered researchers with full-time contracts at a university, which are however less mobile than others. This could be an issue for consideration in view of a MORE-3 study.

As overall conclusion, it is suggested that Science Europe Research Careers Working Group should undertake a focused survey to acquire intelligence on inter-sectoral mobility policies and practices. The analysis will include:

- Review of available evidence on the impact of MO policies and practices on inter-sectoral mobility;
- Survey of current MO policies and practices on inter-sectoral mobility.

The aim is to increase the knowledge base on impact of inter-sectoral mobility policies and practices in Europe. The analysis is a basis to develop new approaches and to explore the connection between inter-sectoral mobility practices and overall strategic and political choices made in each country with regards to publicly-funded research.

Other potential items for the Research Careers Working Group:

- Analysis of NCP feedback on Horizon 2020 schemes to promote inter-sectoral/interdisciplinary mobility and researchers' skills (maybe include them into the survey?)
- Follow-up with career tracking initiatives
- Follow-up of the VITAE RDF and the ADOC Competencies Study (probably dealt with by the EU's Steering Group on Human Resources)
- Follow-up of comparability and monitoring with the NSF

ⁱ This report was drafted by Ulrike Kohl (Fonds National de la Recherche, Luxembourg), member of the Science Europe Working Group, with the support of the Science Europe Office.