

“Building More and Better Bridges Between University and Industry in Europe”

DOC-CAREERS Project Main Conclusions

Dr Lidia Borrell-Damian
Senior Programme Manager
European University Association

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Overview

- Introduction of the European University Association (EUA)
- University-Industry Collaborations¹
- DOC-CAREERS objectives, methodologies and input sources
- Characteristics and Structure of Collaborative Doctoral Programmes
- The voice of stakeholders: universities, companies, doctoral candidates/holders and other shareholders on
 - ✓ Collaborative Doctoral Programmes
 - ✓ Employability
 - ✓ Tracking of doctoral holder careers by universities
 - ✓ Policy making
- Conclusions

¹ The term “industry” is used in a broad sense including for-profit and non-for-profit businesses and enterprises.

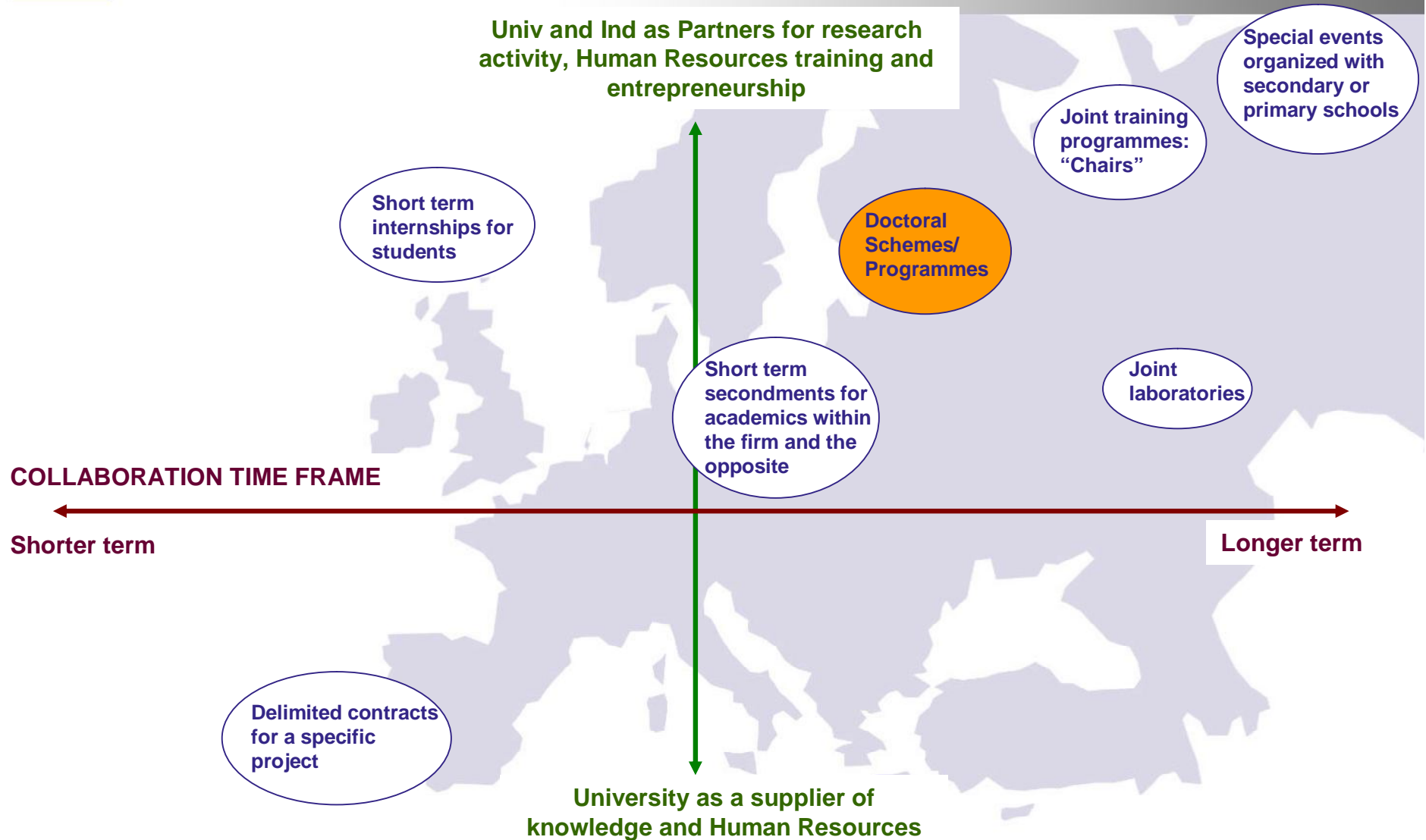
The European University Association (EUA) in Brussels: Independent Stakeholder for Europe's Universities

- Created in 2001 as a result of a merger
- Non-governmental Membership-based Organisation
- 800 Universities in 46 countries (individual members), 34 National Rectors' Conferences (collective members) and university networks (affiliate members)
- Policy Focus: ERA and EHEA - member of the BFUG & BFUG Board since the beginning
- Support to Members: projects, workshops, conferences, web-based newsletters, targeted information and policy statements/positions

EUA in Research and Innovation: Contribution to the implementation of the Lisbon agenda

- University- Business collaboration: Open Innovation model, “Modernisation agenda” for Universities
 - Responsible Partnering Guidelines (EUA, EIRMA, EARTO, ProTon)
 - Dialogue with Stakeholders: European Business Summit, Regional Innovation (EURADA Conference 2008), European Institute of Technology
- Doctoral education: main link between EHEA and ERA
 - Doctoral Programmes: Third Cycle of Bologna Process, Doctoral Programmes Projects, EUA Council for Doctoral Education (launched 2008)
 - Benchmarking: EUA, US/CGS and University Associations from Australia, Canada and China (Global Summit on Graduate Education, Canada 2007; Beijing 2008)
 - Employability issues: Charter and Code; DOC-CAREERS project

University-Industry Collaborations



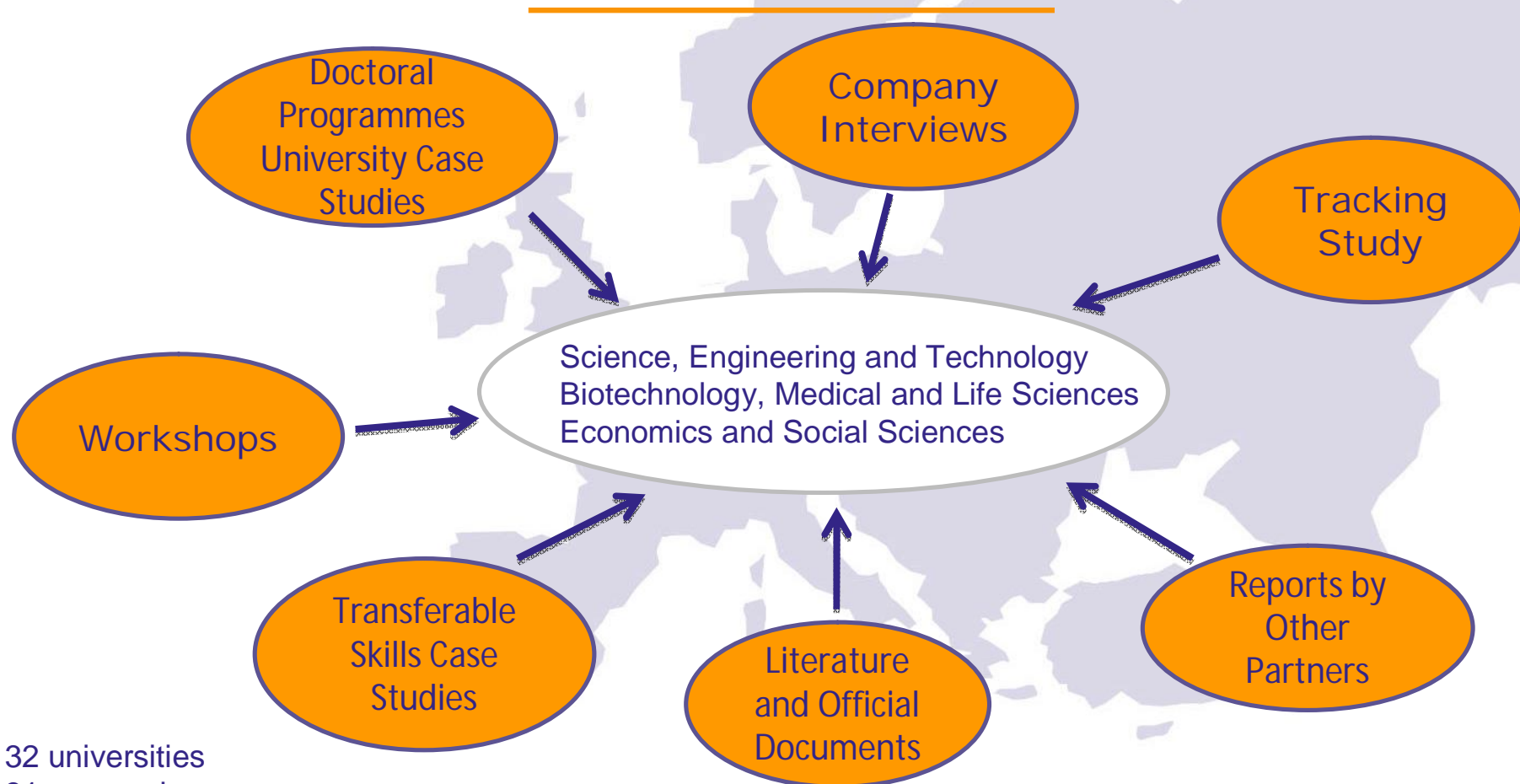
DOC-CAREERS*

Objectives

- Development of transferable skills and competences in the context of employability and career perspectives in private and public sectors
- Nature and extent of university and business collaboration in doctoral programmes
- Mobility strategies for doctoral career development (cross-border, inter-institutional, inter-sectoral)
- Requirements for more systematic collection of data at the university level to provide the basis for analysis of doctoral candidate's career paths

* FP6 Specific Support action

DOC-CAREERS Methodologies and Input Sources 2007-2008



32 universities

31 companies

18 other stakeholders including EIRMA, EURODOC and UK GRAD Programme

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Doctoral programmes in collaboration with industry: what is different?

- Exposure to the private environment and acquire an insight of non-academic organisations
- Joint supervision by professionals from different sectors
- Broaden employability perspectives
- Enable networking outside academic environment
- Access to additional industry training and meetings
- Possibility of additional scholarships (to attend conferences, publish in journals, summer/winter schools, etc.)

Principal Characteristics of Doctoral Programmes in Cooperation with Industry

- Long-term activity (3 to 5 years)
- Entry profile of doctoral candidate – average: Master degree, 25 to 35 years old
- Diverse approaches towards an “Open Innovation” model:
 - ✓ Private initiative from large business: Usually initiated by business, highly structured, based on previous collaborative projects
 - ✓ Private initiative from SME (usually high tech): Sectorial and regional approach with public support (Regional/National schemes and EC Structural Funds when applicable)
 - ✓ University-led: Usually project based, dealt with case-by-case by initiative of individual professor or research team
 - ✓ Public-Private partnership: Structured programme lead by government
- **Partners must find adequate balance:**

Structure - Flexibility

“Structured” doctoral programmes in cooperation with industry

Good basis for:

- Respect of legitimate interest of all parties
- Quality of research
- Quality of management

Degree of structure depending on:

- Field of Knowledge (SET, BML usually more structured than HESS)
- Role of the company (data supplier, network, supervision, placements in firm, funding)
- Main source of funding (public, private or combination)

Structural Components of Doctoral Programmes in Cooperation with Industry

Structural Component	Higher degree of structure	Lower degree of structure
Commitment from the university	Institutional + Professor/Researcher	Professor/Researcher
Commitment from the industry	Top management + Middle management/Research Team	Middle management/Research Team
Role of industry (one or more)	Funding/ Placements/ Supervision/ Data Supplier/ Networking	Supervision/ Data Supplier/ Networking
Public support	Normally yes (but some large R&D companies set their own programmes without it)	Possible
Research project agreed by all parties	Formal	Informal
Contract specifying rights and duties of each party, including IP rights	Formal	Possible
Legal status for the doctoral candidate	Yes (contract, scholarship)	Possible
Supervisory team involving professionals from different sectors	Yes	Possible
Additional entry requirements (company interviews, HR selection processes)	Normally yes	Possible

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University and Industry Views on Collaborative Doctoral Programmes (I)

- A general view is that there is not, and should not be, a single model of doctoral collaboration with industry and universities should be more aware of the employment destinations of doctoral holders and perceive moving from academia not as a second but a legitimate first choice.
- Doctoral education is one way to promote “mindset” changes in academia and enterprises. In fact, many views, opportunities and barriers are shared by both communities. The main challenge is to find timely common interests. Prejudices and difficulties in the execution of university-industry projects can easily overshadow possible advantageous outcomes.
- In general, the university community should perceive moving from academia to business not as a second choice but as a legitimate first choice.
- Doctoral research and knowledge transfer are intrinsically linked and candidates/ holders exposed to collaborative research are natural bridge builders between the two worlds.

University and Industry Views on Collaborative Doctoral Programmes (II)

- Behind the formal procedures such as joint supervision or placements in business, successful long-term university-business cooperation processes are holistic, – i.e. the soft part of the relationship is very important and continuous face-to-face experience is mandatory to build trust and durable partnerships.
- In general, structured doctoral programmes which include a contract signed by all parties and provide legal status for the doctoral candidate are satisfactory for all parties.
- Intellectual Property Rights (IPR) issues, though they may be difficult to address and agree upon, are not seen by successful practitioners as a factor impeding the collaboration. They are, of course, a barrier and the difference between ownership of the IPR itself and ownership of the exploitation rights should be clearly understood.
- Support of governments as facilitators of collaborative university-industry doctoral education is considered crucial. Public support is more necessary for SMEs than in the case of large R&D intensive industry.

Doctoral Candidates of Collaborative Doctoral Programmes: Facing Two Worlds

Benefits include:

- Gain insight of non-academic sector
- Facing “real life” research problems
- Building network of contacts outside academia
- Financial support
- Enhanced employability opportunities, especially outside academia

Challenges include:

- Satisfying simultaneously the needs and expectations of university and industry, as well as the candidate's
- Dealing with opposing dynamics and pressures
- Dealing with different levels of interest and commitment from the partners
- Drafting “duplicate” reports on the same research outcomes

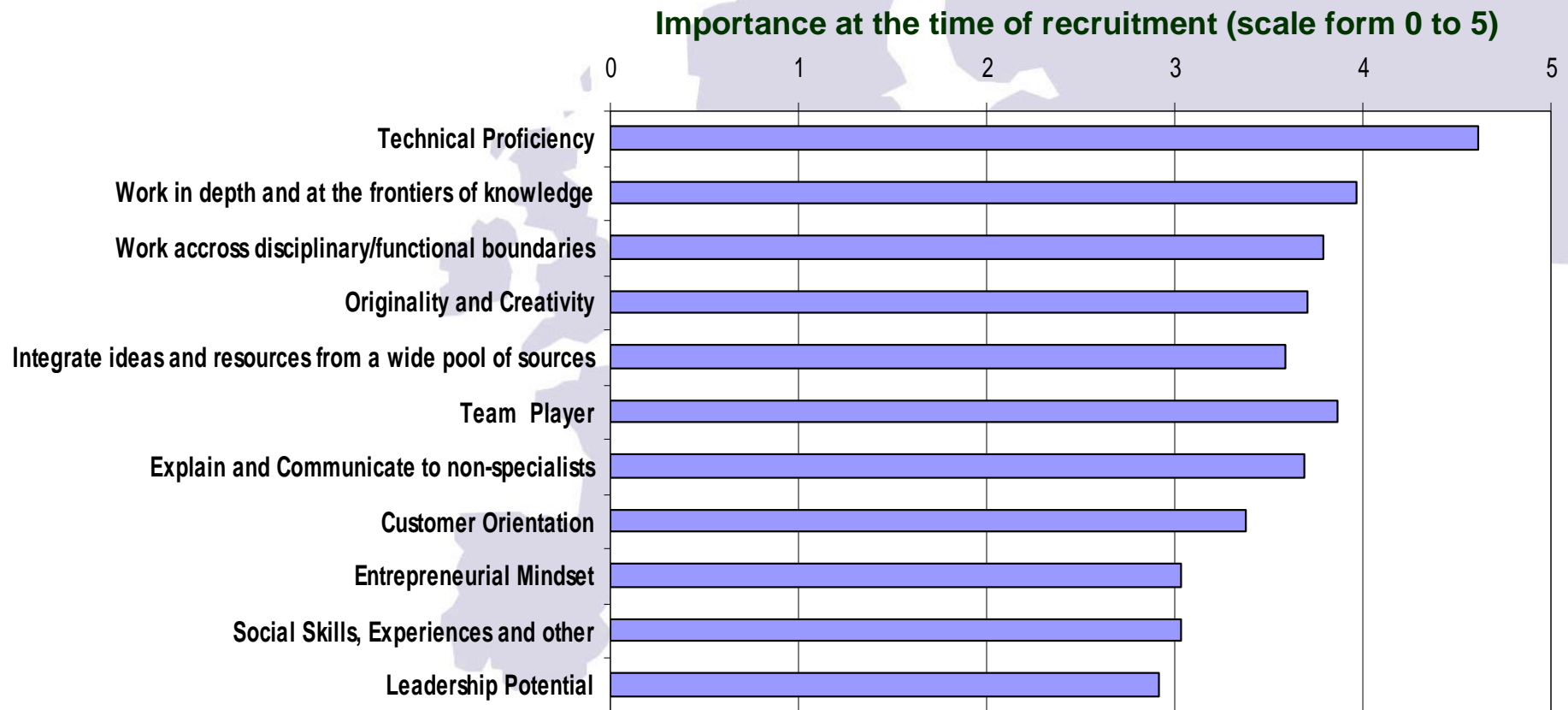
Overall, was it worthwhile?

Quote from a doctoral candidate: ‘It was hard (still is, just finished writing up) and I underestimated what it would take, but I have learnt a hell of a lot which I wouldn't have done if I'd done a straight academic PhD. Working with a partner organisation both massively made it much harder but also enriched the experience.’

Employability perspectives

- **General opinion by universities, industry, doctoral holders:**
YES, doctoral holders graduated from these kind of schemes are more employable, especially outside academia.
- **Provision of employment opportunities at the end of doctoral studies:**
 - ✓ Usually provided when scheme is
 - Private initiative from large business
 - Public-Private partnership
 - ✓ Not very often provided when scheme is
 - Private initiative from SME
 - University-led
- In Europe, approximately 50% of doctoral graduates first employment destination is outside academia.

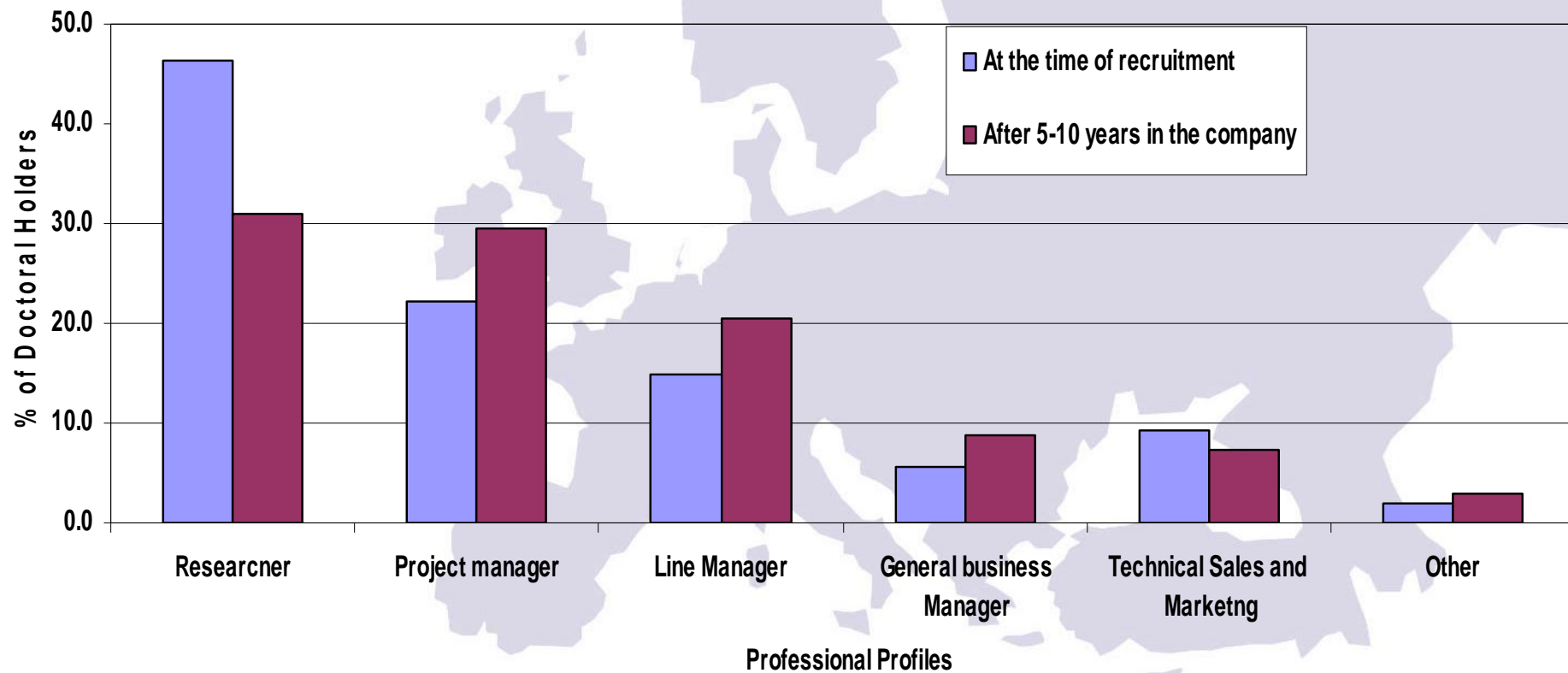
Doctoral Holders in Enterprises: What skills make them employable?



Transferable skills and employability

- Career paths of doctoral holders employed outside academia (both in research and non-research positions) are extremely diverse.
- Transferable skills in doctoral holders are important for developing careers both inside or outside academia.
- Raising awareness of skills acquired through the doctoral process is needed for doctoral candidates to widen their range of employment opportunities and mobility horizons.
- There is a group of core competencies common to all fields that make a doctoral holder employable outside an academic context. They are related to communication, negotiation and management skills, as well as the ability to apply creative thinking and the capacity to adapt to business contexts and deal with complex and multidisciplinary work.
- Though very variable, the need for transferable skills training are differently viewed by R&D intensive companies (large or small) than by medium or lower R&D companies and by doctoral candidates/holders.

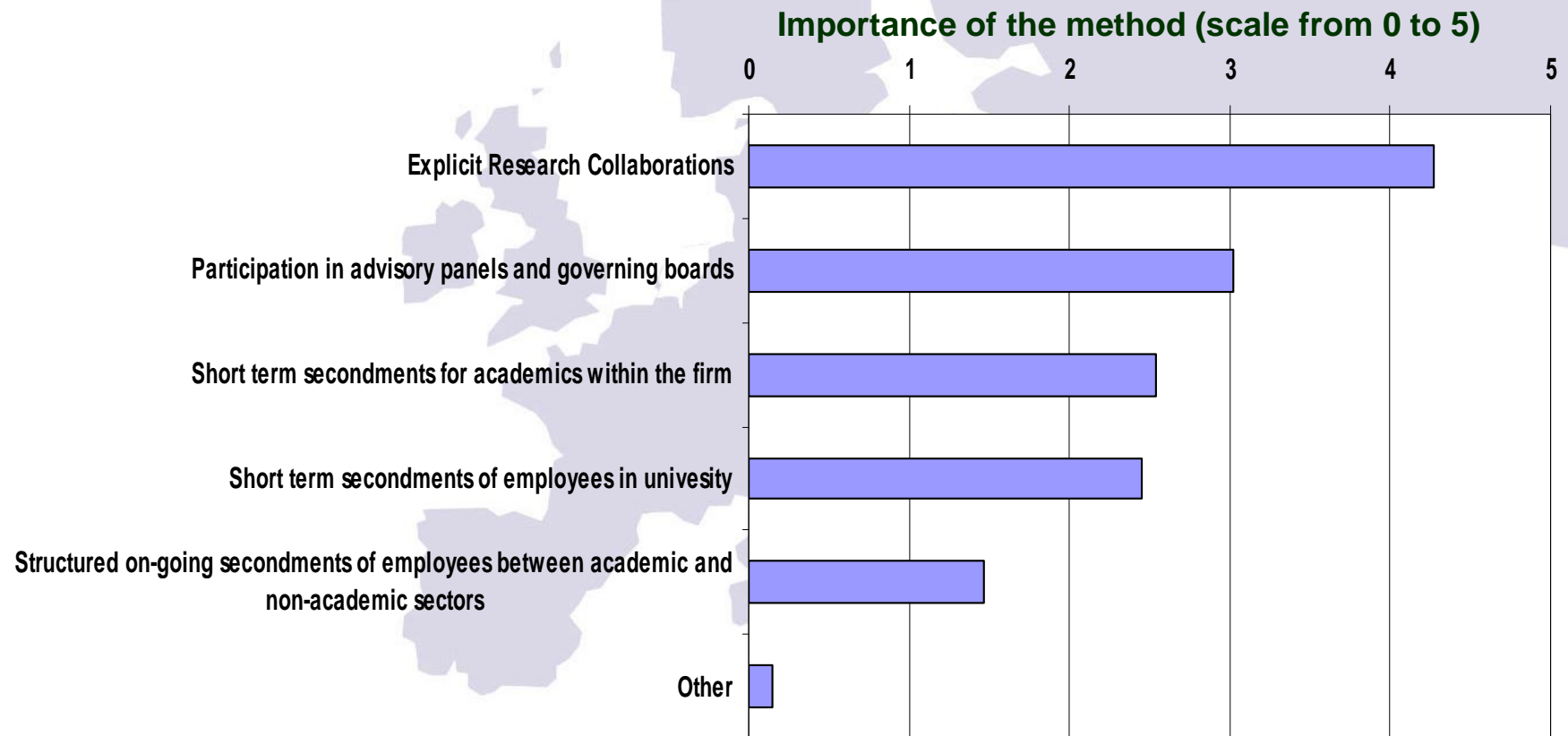
Doctoral Holders in enterprises: What do they do?



Mobility as a way of enhancing employability

- Mobility –within academia or between academia and business– can also help to improve the prospects for employability, especially outside academia.
- In general, mobility is particularly valued by employers of highly skilled professionals. The value lies in the exposure to different environments and in the benefit that the individual gains from learning and playing different roles, interacting with different people and building up his/her own network of contacts.
- Secondments of academics in business or business employees in academia are valued by R&D-intensive business BUT
- There are structural and environmental factors (e.g. career benefits, peer group recognition) inhibiting the regular movement of employees between the academic and non-academic sectors.

Mobility schemes between academia and industry



Tracking Doctoral Holder Careers by Universities: Benefits and Challenges

- Main benefits include:
 - ✓ Developing doctoral training schemes
 - ✓ Defining institutional profile
 - ✓ Reinforcing partnerships with business
- Main challenges include:
 - ✓ Representativeness of respondents: bias to academia and to the successful
 - ✓ Institutional commitment: senior management and academics
 - ✓ Implementing findings and recommendations
- In Europe there is a general lack of university institutional follow up on doctoral holders professional destinations. EUA is examining good practices in the DOC-CAREERS project.
- Institutions should track their doctoral graduates to become significant drivers at institutional, national and international level and to inform doctoral candidates of their potential employment options.

Policy making bodies at work: which kind of support can they give?

Support of governments as facilitators for university-business cooperation processes and growing awareness of IPR is considered crucial:

- Stimulate culture of both technological and non-technological innovation in industries
- Formulate strategies for innovation and implement them effectively
- Develop sustainable funding schemes incentivising university-industry cooperation
- Support platforms for networking
- Sound evaluation procedures for good quality projects

Conclusions

- Trust and excellence as hallmarks for successful long-term university-industry collaboration
Long(er)-term goals
- Doctoral Candidates as "bridge builders" between university and industry
- General Conclusions

Trust and excellence as hallmarks for successful long-term university-industry collaboration

- Long(er)-term goals
- Timely common research interests
- Proximity, direct contact between university and industry leaders - teamwork
- High quality research
- Effective university and industry governance and management
- Balance of structure and flexibility
- IPR knowledge
- Policy and Public support

Doctoral Candidates as "bridge builders" between university and industry

- Doctoral process is about acquiring original knowledge through research.
- Knowledge transfer is intrinsically linked to research and doctoral education.
- Doctoral holders are employed outside academia. University community should take into account this reality and start perceiving doctoral industry careers not as a second but as a legitimate first option. Industry should become more aware of and recognise the added value of the doctoral holders skills.
- Status of doctoral holders in society should be upgraded and the implicit skills acquired through research should be made more explicit to employers.
- Doctoral programmes in Europe should be diverse enough that graduates have options for broad professional career perspectives where they can serve the society with their special skills.

General conclusions

- Universities and enterprises share many views on opportunities, challenges and barriers of university-industry cooperation.
- There are no “one-size-fits-all” ways forward for University-Industry collaborative doctoral programmes. They tend to be specific to every field/case including local or regional cultural differences.
- The state-of-the art dialogue between university and industry is reaching a level of maturity leading to a window of opportunity for effective action on promoting durable relations between the two worlds.
- Public support is crucial for the development of these sort of initiatives
- The skills of creative workers acquired during research education can serve the knowledge society by developing new ways to deal with problems. Mobility is an asset for their employability.
- More and better prepared doctoral holders for employment in industry environments provide enhanced opportunities for Europe to become more competitive at a global scale.

DOC-CAREERS

Participant Organisations

HIGHER EDUCATION INSTITUTIONS

- Delft University of Technology, The Netherlands
- EDAMBA (European Doctoral Programmes Association in MBA)
- EMBO (European Molecular Biology Organization)
- Erasmus Research Institute of Management (ERIM), The Netherlands
- ESADE Business School, Spain
- European University Institute, Italy
- Frankfurt Graduate School for the Humanities and Social Sciences (FGS), Germany
- Ghent University, Belgium
- Hanken Swedish School of Economics and Business Administration, Finland
- HESA (Higher Education Statistics Agency), UK
- Imperial College London/IDEA (Imperial College London, Delft University of Technology, ETH Zurich, Aachen University RWTH), UK
- Katholieke Universiteit Leuven, Belgium
- London School of Economics and Political Science, UK
- Masaryk University, Czech Republic
- Matej Bel University, Slovakia
- Mykolas Romeris University, Lithuania
- National and Capodistrian University of Athens, Greece
- Newcastle University, UK
- Ruhr-Universität Bochum, Germany
- Simula School of Research and Innovation AS, Norway
- Technische Universität Ilmenau, Germany
- UK GRAD Programme, UK
- Universitat Autònoma de Barcelona, Spain
- University of Aarhus School of Business, Denmark
- Università degli Studi di Milano, Italy
- University of Cagliari, Italy
- University of Helsinki, Finland
- University of Jyväskylä, Finland
- University of Paderborn, Germany
- Université Pierre et Marie Curie, France
- Utrecht University, Belgium
- University of Wales - Bangor, UK
- VŠB-Technical University of Ostrava, Czech Republic

OTHER PARTNERS

- ABG (Association Bernard Gregory), France
- CEASER (Conference of European Schools for Advanced Engineering Education and Research)
- Comunidad de Madrid, Spain
- DG Research
- EURODOC
- EFMD (European Foundation for Management Development) ...29...

ENTERPRISES

- Arçelik, Turkey
- Arcelor Mittal, France
- Arjo Wiggins Appleton, France
- Bekaert, Belgium
- BioCydex, France
- Corus, The Netherlands
- Dow Corning, UK
- EIRMA, (European Industrial Research Management Association), France
- Eurofins Scientific, France
- Haldor Topsøe, Denmark
- IBM, Switzerland
- Infineum International, USA-UK
- Lafarge, France
- L'Oréal, France
- Microsoft Research, UK
- Nestlé, Switzerland
- Novo Nordisk, Denmark
- Océ, The Netherlands
- Oridis Biomed, Austria
- Outokumpu, Finland
- Philips, The Netherlands
- Procter & Gamble, UK
- Renault, France
- SCA, Sweden
- Schlumberger, France
- Siemens AG, Germany
- Solvay, Belgium
- Stora Enso, Finland
- Swisscom, Switzerland
- SYNPO, Czech Republic
- Thales, France
- VTT Technical Research Centre of Finland, Finland
- Helmholtz Association, Germany
- LERU (League of European Research Universities)
- Marie Curie Actions
- Ministry of Science, Technology and Innovation, Denmark
- NIFU STEP, Studies in Innovation, Research and Education, Norway
- OCED, France
- VSNU (Association of Universities in the Netherlands), The Netherlands

DOC-CAREERS REPORT

Extensive details of the evidence supplied by DOC-CAREERS participant organisations supporting all these points and subsequent recommendations to stakeholders will be provided in the report which EUA will publish during early 2009.

The publication will be shortly available at:

<http://www.eua.be/research/doctoral-programmes/doc-careers/>

Next phase of DOC-CAREERS

Areas for further action are currently being considered by EUA on how universities work with partners within their region in doctoral education and their strategies for the recruitment and retention of doctoral candidates and holders.