EuroTech Universities
Excellence in Science and Technology

NORDIC FIVE TECH

CESAER
conference of european schools for advanced engineering education and research

CLUSTER | LEADING UNIVERSITIES OF SCIENCE AND TECHNOLOGY

IDEA League
A focused network of leading European universities of science and technology

Come share your Innovative Doctoral Training

Joint workshop by CESAER, CLUSTER, EuroTech Universities, IDEA League and Nordic Five Tech

29-30 August 2016

The workshop *Come share your Innovative Doctoral Training* which took place at DTU 29-30 August 2016, gathered more than 80 participants from 30 universities and 7 institutions responsible for and engaged in doctoral training across Europe. In this memo we collected some of the ideas, good practice examples and recommendations shared at the workshop relating to innovative doctoral education.

The seven Principles of Innovative Doctoral Training:

1. research excellence
2. attractive institutional environment
3. quality assurance
4. interdisciplinary research options
5. transferable skills training
6. exposure to industry and other relevant employment sectors
7. international networking

With an aim to promoting the *European Research Area,* universities have since 2012 been encouraged to implement the Principles of Innovative Doctoral Training. The primary focus thus far has been on high quality research and mobility of researchers between countries and sectors. At the workshop, Rinske Van den Berg, Policy officer for Open Science and ERA Policy at the European Commission, also pointed at the importance of innovative doctoral training to the *Open Science agenda* where the aim is to bring more actors into the innovation process, helping Europe capitalize on R&D, and diffuse knowledge through collaboration and digital technology.

Today only 45 % of European researchers work in the private sector compared to 78 % in the USA. Universities of science and technology have strong traditions of *collaboration with industry* and in some countries as much as 90 % of the candidates find work outside academia. At its best, collaboration with industry provides additional funding which enables universities to keep advanced laboratories, engage a larger number of research candidates, and pursue fundamental research with great impact and relevance to industry. This works well as long as the university safeguards its autonomy to collaborate also with other companies and ensure that company IPR does not impede the public defence of a PhD project. In case of conflicting interests, it should never be at the expense of the PhD candidate.

International networking is valuable as it exposes researchers to other ideas, methods and problems. The EU is encouraged to keep up the funding of Marie Curie Training Networks and the work removing barriers to mobility within Europe and from outside. Researcher education is organised differently from country to country; in international agreements on

PhD collaboration, a good advice is thus to focus on the content of the research rather than the legal constraints. Joint supervision agreements are much more manageable than joint degrees.

Industrial and highly complex societal challenges call or interdisciplinary *approaches*. Universities of science and technology stimulate interdisciplinary exposure and collaboration through social and academic networking opportunities, shared campus facilities and thematic research programmes, crossing departmental and disciplinary lines. Our researchers report a need for more funding for interdisciplinary research, and available channels for the publication of interdisciplinary research results.

“It takes a village to raise a child”. The same logic applies to a researcher. Today all universities offer a structured PhD education where institutional quality measures supplement the traditional personal relationship between candidate and supervisor.

Supervision is key, and many universities offer staff training courses for new supervisors. Co-supervision by academics with complementary competence on the research and the work process should be encouraged. Information meetings for candidates and supervisors are also useful to align expectations from the start.

Having a second eye on the PhD-project has proven useful at many universities, and procedures to this end have been included in *university quality systems*. Candidates should get the opportunity to present the project to peers other than their supervisors, for instance after 9 months or mid-term. The objective should be to get feedback on the project in order to improve the likelihood of successful completion, and if need be to terminate the project. Also 3-6 months before the public defence, it is productive to offer external feedback before the candidate finalizes the public thesis.

Transferable skills courses should be part of all doctoral training programmes, first of all as a means to improve their ability to successful completion of the doctoral degree, and secondly because these skills and competences are valued by future employers. Candidates should be in the driver’s seat and be allowed to choose courses depending on their needs and with the aim to increase their non-academic employment opportunities.. As time is so precious, short, blended learning style courses that are immediately useful, is what we should aim for.

External periodic reviews are part of the quality assurance systems at bachelors and masters level, but not necessarily at doctoral level. Traditional research assessment will include the PhDs research activity, but not necessarily the education system as such. Periodic review of the PhD-education is thus recommended to further enhance the quality in researcher education. For mutual learning and benefit, the members of the university alliances should share reviewers, recommendations and good practice across Europe.

Presentations and pictures from the workshop are available at www.dtu.dk/IDT