

JOINT SEA-EU INDUSTRIAL PHD MODEL



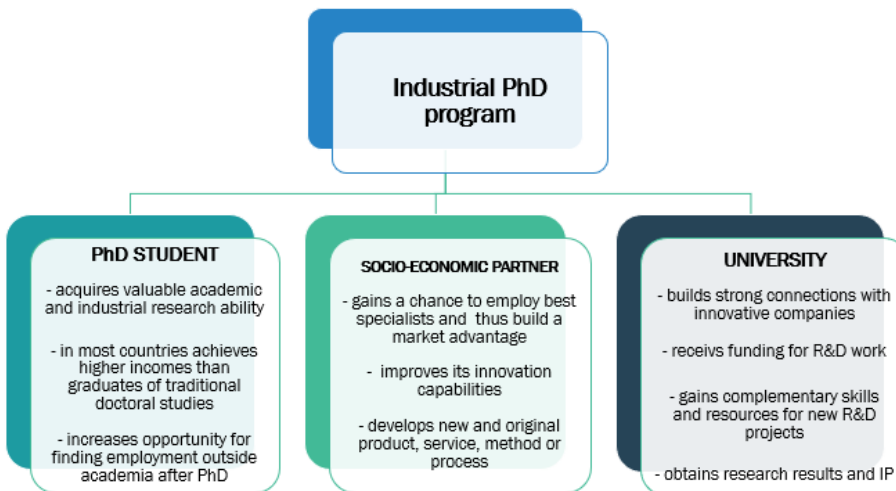
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What is an Industrial PhD and why is it important?

Collaboration between industry and academia ensures dissemination of knowledge from research and development to industry and society at large. One of examples of such collaboration in the Industrial PhD that contributes to needs-driven research and fosters in-depth interchange between academia and industry in which all three included parties, student, company and university gain benefit.



The definitions of Industrial PhD slightly vary across different countries and funding agencies. For example, Innovation Fund Denmark defines it as an industrially focused research project which is conducted jointly by a private sector company, an Industrial PhD student and a university (Innovation Fund Denmark, 2019) ¹. While working on the research project the student is enrolled as a PhD student at the university, divides her/his working hours between the company and the university, and spends all of his/her working hours on the Industrial PhD project.

European Union, recognising that the well-functioning innovation system and knowledge-based economy is not possible without highly-skilled and talented individuals, has introduced the program of European Industrial Doctorates, with the goal to strength the academia-business collaborations, develop PhD candidates' skills to meet the needs of industry and foster industrial competitiveness and research environment (EID Final Report) ². In the EID Final Report, the in-depth study is given of the four ³ national programmes, including the Danish one that in its first version started in 1971. The results and impact of the EID program led to continuation of Industrial doctorates funding within the Doctoral Networks program. Industrial doctorates within the Horizon Europe are particularly interesting possibility for strengthening the cooperation among the SEA-EU alliance regions.

SEA-EU alliance is currently developing one joint PhD study program, which is expected to be adopted and implemented in the next phase of alliance, within the SEA-EU 2.0 project. Although the Industrial PhD is not in the focus of the first phase of the PhD program development, we have recognised it is important to develop a joint, well-balanced Industrial PhD model that could be implemented in joint PhD studies. Important feature of I. PhD is giving students opportunity for on-the-job training through which they can gain practically relevant and professional tacit knowledge, as well as enhance their set of soft skills. In developing the model, it is therefore important to maintain this feature, but also to take into account the existing regulations governing doctoral education of the different universities, the funding possibilities, experiences, and needs of companies.

Six SEA – EU partner Universities (University of Cadiz - UCA, University of Gdansk - UG, University of Western Brittany - UBO, Kiel University - CAU, University of Split - UNIST and University of Malta - UM) actively collaborated with stakeholders from their region while trying to identify major skill gaps. Six local stakeholder group meetings were organized prior to the final, joint stakeholder meeting and Industrial PhD workshop, held in Split from April 4th to April 6th, 2022.

¹ https://innovationsfonden.dk/sites/default/files/2019-10/guidelines-for-industrial-phd-2019-10-10_0.pdf

² European Commission, Directorate – General for Education, Youth, Sport and Culture, European industrial doctorates: towards increased employability and innovation: final report, Publications Office, 2017, <https://data.europa.eu/doi/10.2766/643937>

³ The Industrial PhD programme, Denmark; The Industrial Agreement of Training through Research (CIFRE), France; Industrial graduate programme, Sweden and Industrial CASE studentships, United Kingdom.



Main features of the existing Industrial PhD models at the University of Cadiz, the University of Gdansk and the University of Western Brittany

“The Industrial Doctoral Thesis Program enables the realization of projects that bring together Industry and innovation, while providing notable scientific and technological importance that are related to strategic innovation lines of the company that proposes it. The project needs to be realized in three years. These collaborative projects are developed under the supervision of one PhD researcher from UCA and a co-supervisor (PhD graduate) from the company, with the support from the research group, laboratories, technical equipment, and resources from the University.” (Industrial Doctoral Thesis program at UCA) ⁴

“Industrial doctorates are an alternative route to obtaining a doctoral degree. It is intended for people who, in order to develop their scientific career, do not want to give up their professional work outside the university.” (Industrial Doctorate Program at UG) ⁵

“The Industrial Conventions for Training through Research (Cifre) allows the company to receive a financial aid for recruiting a young doctoral student, whose research, conducted in a public research laboratory, will lead to the defense of the thesis. Widely accepted by the enterprises, but also laboratories and doctoral students, this flagship plan of partner research represents a facilitator for initializing and reinforcing the cooperation between public and private sector within research and development area and promote the employment of doctoral students.” (CIFRE / Convention Industrielle de Formation par la Recherche)⁶

The Industrial PhD program currently exists at three SEA-EU partner Universities: University of Cadiz, University of Gdansk and University of Brest The University of Malta has the PhD Chair model.

At the University of Split, the Industrial PhD program is not implemented but it is planned under the National Recovery Resilience Plan (2021-2026). This Industrial PhD program is planned to have a duration of four years and during that time, PhD student should be employed full time at the company where he is conducting his research. This program will be especially encouraging for PhD students from the areas of STEM and ICT.

⁴ Adapted from: <https://politicacientifica.uca.es/capital-humano-investigador/contratos-predoctorales-en-industria/>

⁵ Adapted from the PowerPoint presentation “Industrial PhD in Poland; the experience of the University of Gdańsk” by Prof. Krzysztof P. Bielawski

⁶ Adapted from: <https://www.enseignementsup-recherche.gouv.fr/fr/les-cifre-46510>

Comparison between Industrial PhD programs across SEA-EU alliance


	DURATION OF THE I. PhD PROGRAM	SUBSIDY RECEIVED	APPLICATION PROCESS	
UCA ⁷	Full-time: 3 years + 1-year extension+ exceptional extension of 1 year	Industrial PhD candidate receives a full-time contract, and the cost of his salary is covered by UCA (50 %) and by the company (50 %) over a three-year period. In 2018, the fixed amount for the company share (50 %) was 11.500 euros annually.	After the signing of the cooperation agreement between the University and the company, the public call is launched in order to select the best PhD candidate.	The University of Cadiz and the company collaborating on the research of the I. PhD candidate share the ownership of the research results and innovation. The ownership is regulated by the internal agreements. The University is responsible for the protection of the invention and draws partial financial benefit from its exploitation. ⁸
UG	4 years max.	The Industrial PhD candidate receives a salary at the company where he conducts his research and is employed full-time, He also receives a scholarship from the Ministry of Science and Higher Education. The starting scholarship amount is 3 450 PLN (720 euros) and is increased by 1000 PLN (208 euros) after the mid-term evaluation positive results. Students' social insurance costs are also covered by the scholarship.	After the PhD student is admitted to the Doctoral School at UG, he signs a full-time working contract with the company participating in the Industrial PhD program. Student is assigned an assistant supervisor at the enterprise, who shall monitor his progress in the conduct of the scientific activity.	Intellectual property regulations are included in the agreement between the company, the student and the Doctoral School.

⁷ The program is called Industrial mention in the Doctorate Degree.

⁸ Reglamento UCA/CG14/2007, de 14 de DICIEMBRE, de patentes de la Universidad de Cádiz.

		Research units included in the research receive a lump sum funding for the costs of the use of the research infrastructure. The sum is defined by the regulation of the relevant Ministry.		
UBO ⁹	3 years	The company receives an annual subsidy of 14 000 euros over three years period. During that time, I. PhD candidate receives a full-time contract at the company, and his salary is an eligible cost for the Research tax credit (CIR). ¹⁰	The company recruits an I. PhD candidate and offers him a research project that will be the subject of his PhD thesis. The company receives subsidy from the National Agency for Research and Technology (ANRT), regulated by CIFRE. The company representative also signs a collaboration contract with the research laboratory. ¹¹	The rules on intellectual property rights are defined in the agreement signed between the company where the doctoral researcher works and any joint supervisory bodies (research organization or other institution).

Suggestions for the development of the Industrial PhD model within the joint PhD program

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- The student must be enrolled in a joint PhD program, which is free-of-charge for student
 - PhD student must have a full-time working contract (over a three-year period at least for full-time students)
 - The student works on the research project which is carried out in the company or public administration (socio-economic partner which is not university of public research institute); the research project is directly related to PhD thesis
 - The student divides her/his between working in the socio-economic partner and at least two partner universities (typically minimum 20% of time at the academia and non-academic institution; to be agreed at the beginning)

⁹ When it comes to financed doctoral programs at the University of Brest, the first and the most important requirement is the doctoral contract. Over three years period of time, it brings the beneficiary all social guarantees of the working contract. It can be financed by higher education institutions, research institutions, territorial collectivities, enterprises, European Commission, etc.

¹⁰ **CIR/ le crédit d'impôt recherche** is a public aid that allows to support the efforts of an enterprise in the field of research, development and innovation. It equals 30% of expenses (for the first category up to 100 million euros).

¹¹ The research laboratory where the doctoral work is carried out on the academic plan is linked to Doctoral school.

- Industrial PhD student respects fundamental ethical principles and responsible research practices promoted by his home University.

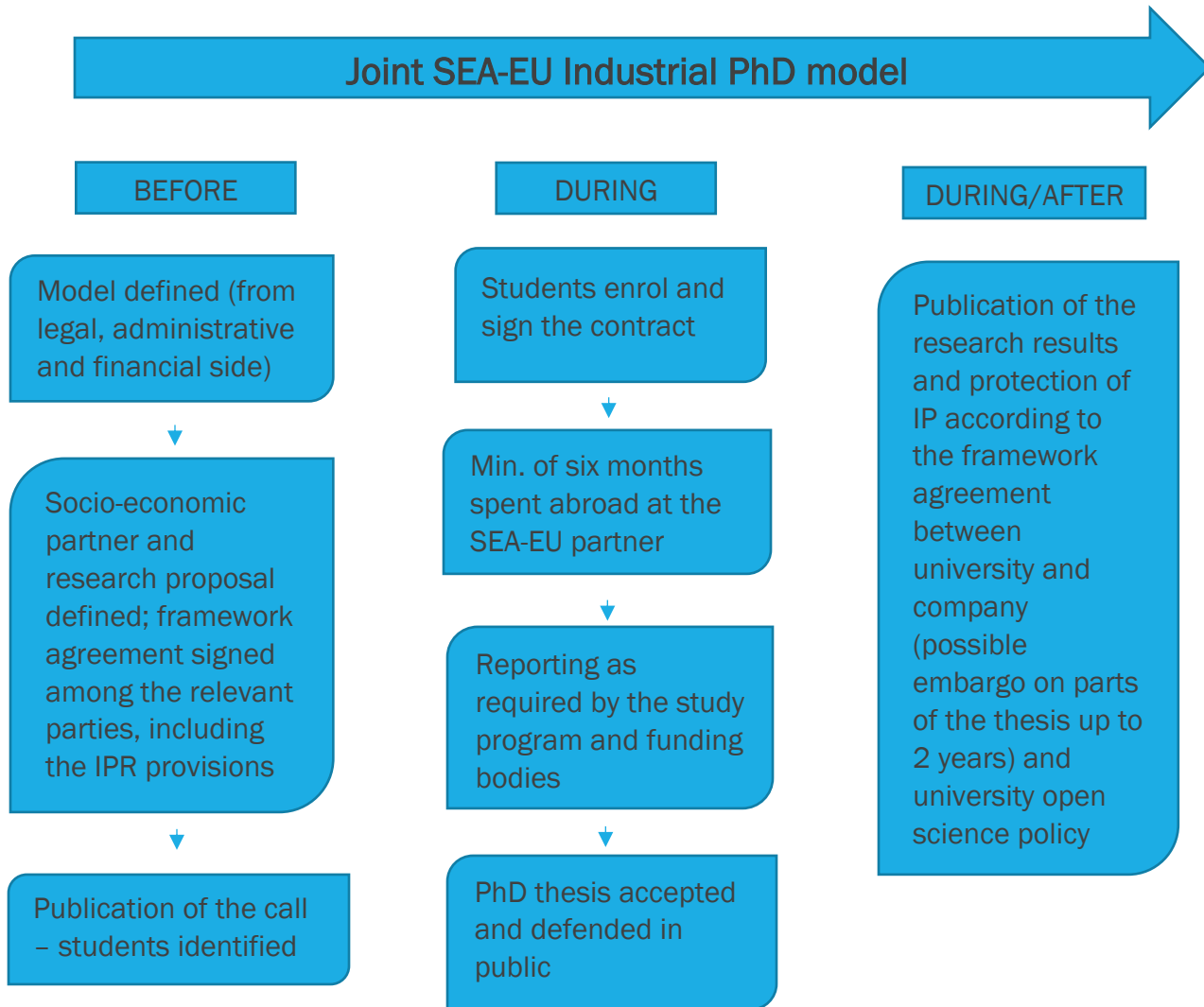
- There needs to be at least one academic supervisor appointed by the relevant universities and one supervisor from the socio-economic partner.
- The socio-economic supervisor must have a doctoral degree or at least five years of experience in conducting scientific activity. Exception are supervisors who realized substantial achievements in the field.¹² The socio-economic supervisor can be a Thesis (Co-)Supervisor in case she/he meets the PhD program criteria. The socio-economic partner can also assign an assistant supervisor to further support the student.

- A framework collaboration agreement is signed between the parties involved in the research project that forms the bases of Industrial PhD (socio-economic partner and the university). The agreement states the obligations of the university and of the socio-economic partner (means and resources), as well as the procedure for the selection of doctoral students, publication and access to results and ownership of the intellectual and industrial rights derived from the thesis.
- In case the research project is funded by an agency or national program, appropriate contracts are signed. Depending on the funding agency the student can be a co-signatory.
- The student signs an employment contract and a Study agreement detailing his/her obligations and rights within the PhD study program

- Student must undertake an international mobility during the period of studying (at least six months) at another SEA-EU university. To finance the mobility, the student can use any source of funds (for example Erasmus+, but not necessarily). During the internship period, I. PhD student will continue to work on the research project and if relevant assist a training course at the partner SEA-EU University or visit the companies related to his research.
- The student and the supervisors comply will all the PhD study programs requirements for reporting. Additionally, they comply with the requirements for reporting to the funders, as stated in the relevant agreements.
- The PhD Assessment Committee is appointed by the University. It must include at least one person with industry relevant research experience within the research field.
- Mentor is excluded from the Evaluation Committee
- Defence of the PhD thesis must be public event (in case of sensitive content the present public must sign the Non-disclosure agreement)
- After the defense, the doctoral thesis is deposited in an institutional repository. In the case of confidential thesis, access to the complete thesis requires the signature of a confidentiality

¹² The *substantial achievement in the field* is defined as a significant contribution in the development and implementation of an original design, construction, technological or artistic solution in the economic or social sphere, with a supra-local scope and a sustainable and universal character.

agreement. The doctoral thesis may be classified as confidential for a defined period of time, not longer than 2 years.



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