

## Bridging the gap between Higher Education Institutions and Companies. The HEIBus Cooperation Models

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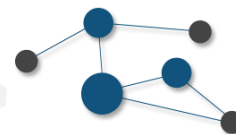
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# HEIBus

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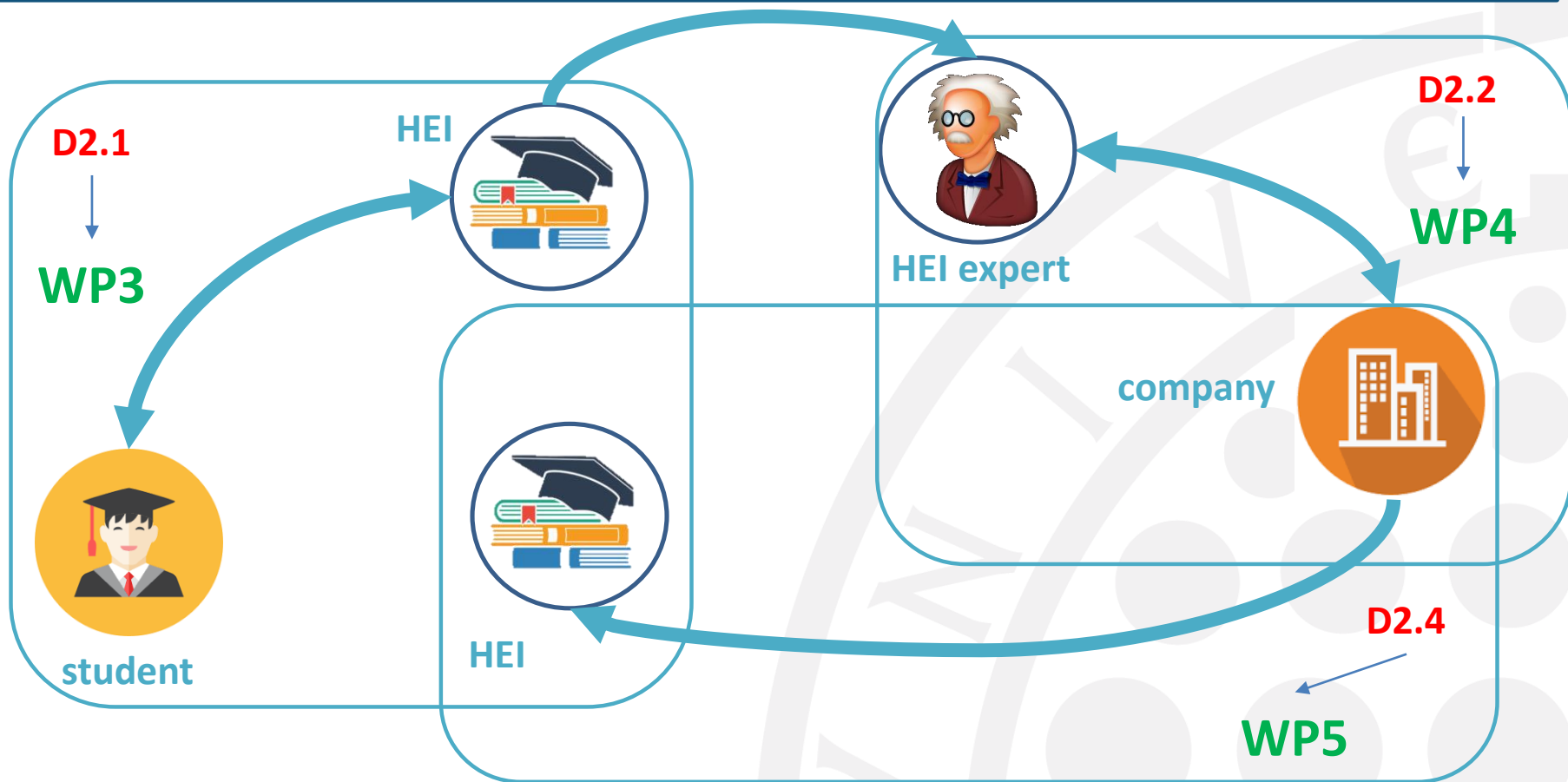
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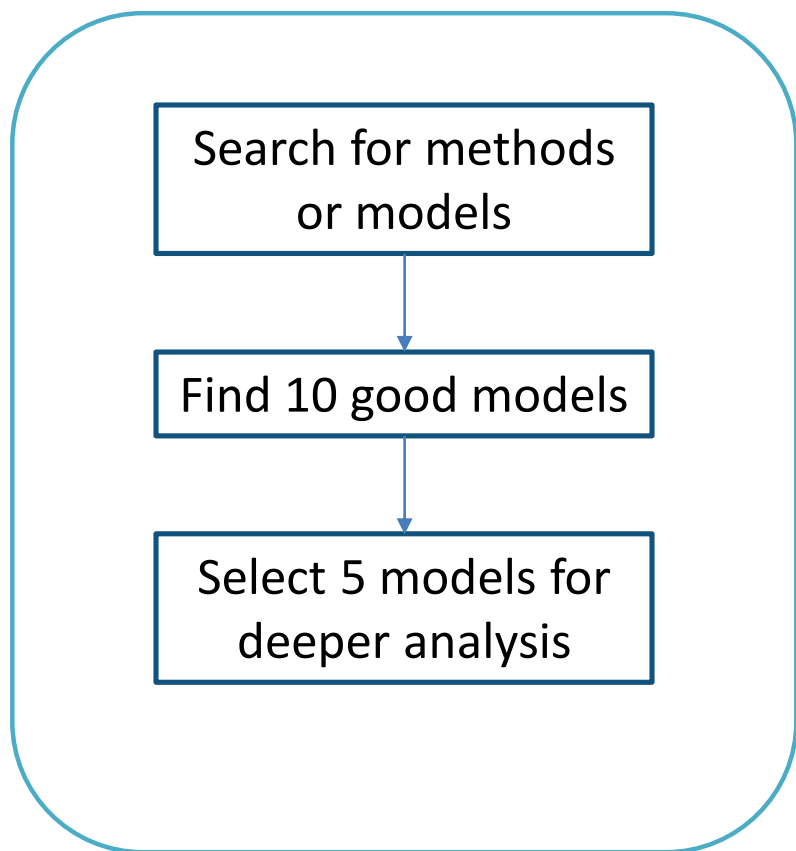
## WP2 GOAL

- To analyse the existing cooperation models providing real life experiences between HEIs and companies
- Serve as basis for the WPs HEIBus project

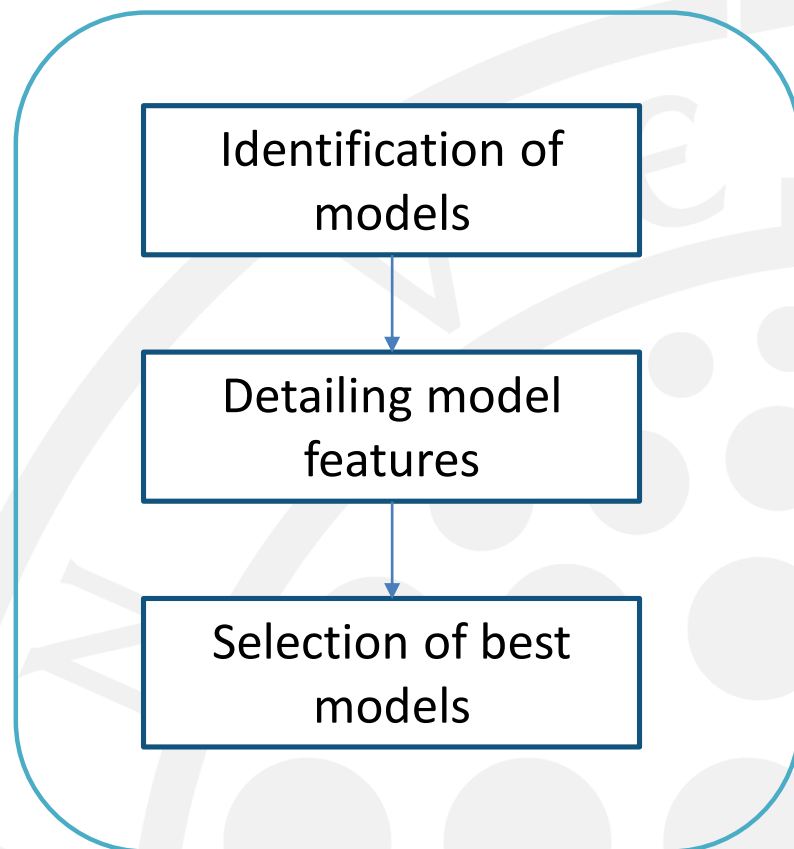


## METHODOLOGIES

### D2.1 & D2.2



### D2.4





## STUDENT-COMPANY COOPERATION MODELS

Search for methods or models

### Work Integrated Learning (WIL)

Process through which students come to learn from experiences in educational and practice settings

Most widespread

- Cooperative education
- Internship
- Apprenticeship
- Field Experience
- Mandatory professional practice
- Applied research learning
- Service learning



## STUDENT-COMPANY COOPERATION MODELS

### Cooperative education

Structured method that combines **classroom based education** with **practical work experience**

1. Full-time:  
40hours per week in alternating periods of work and school
2. Part-time  
20hours per week combining work and school during the same time period

Can be repeated in multiple times  
University career extended a Year or more  
Work experiences are paid and supervised by a professional

### Cooperative education

Students work in their expected career field. Normally at the end of the program study

1. During a Semester
2. In Summer



Students only can done once  
University career is not extended  
Can be paid or unpaid

## Finding 10 good models

**Four categories** where defined and models within these categories where described

☐ Cat. 1 → Basic co-op educational models

Models which follow cooperative education and the students have the possibility of working in several companies

☐ Cat. 2 → Company specific co-op educational model

Models in which students do the training in one Company

☐ Cat.3 → Internship Company

Models in which students are hired by the university and work in a several companies

☐ Cat.4 → Internship Research

Students are involved in research projects

## Selection of five models

### Criteria:

- ❖ Students are engaged in productive work
- ❖ Students receive some form of remuneration
- ❖ Students progress is monitored by the institution
- ❖ Performance evaluated by an employer
- ❖ .....

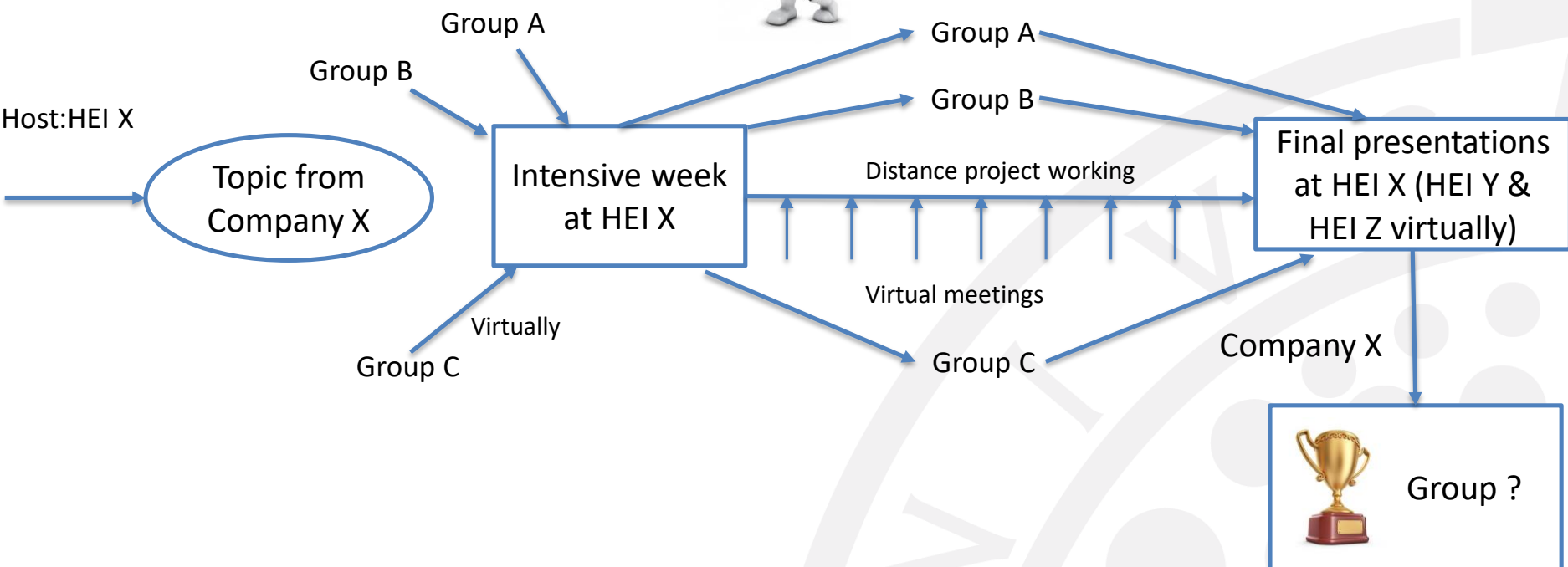


Models	Model Type	Internationalization	Accreditation
M1	Basic co-op	YES	ZEvA
M2	Basic co-op	NO	--
M3	Basic co-op	YES	--
M4	Basic co-op	YES	CAFCE
M5	Company Specific co-op	NO	--
M6	Company Specific co-op	YES	--
M7	Company Specific co-op	YES	--
M8	Internship Company	NO	--
M9	Internship Company	YES	--
M10	Internship Research	NO	--

# HEIBus MODEL: REAL LIFE SOLVING PROBLEM



Supervisors from HEIs X+Y+Z



- Group A: 2 students from HEI X + 2 students from HEI y + 2 students from HEI Z
- Group B: 2 students from HEI X + 2 students from HEI y + 2 students from HEI Z
- Group C: 2 students from HEI X + 2 students from HEI y + 2 students from HEI Z

## Models main features



Coop.  
Educ.

Combines classroom based education with practical work experience

Coop.  
Educ.

One semester but a minimum of semesters are required

Coop.  
Educ.

Company pay a salary

Internships

Normally optional but may be compulsory  
The students receive a scholarship

Internships

Typically long (12-16 months) but may be shorter



1

Multilingual

2

Multidisciplinary

3

Virtual team work

4

Practical work experience

5

Duration: one semester

6

Performance evaluated by the company

7

Students receive a scholarship to afford the intensive week

8

Students are engaged part-time

9

Students are supervised

## Search for methods or models

<i>Rapini et al. Brazil (2015)</i>	<i>Schartinger et al. Austria (2002)</i>	<i>Perkmann &amp; Walsh US (2007)</i>
<p>Short-term R&amp;D collaborative projects</p> <p>Consultancy</p> <p>Training and courses</p> <p>Technical evaluations, project management</p> <p>R&amp;D projects that complement innovative activities in companies</p> <p>Long-term R&amp;D collaborative projects</p> <p>Temporary personnel exchanges</p> <p>Technology transfer</p> <p>Product Tests</p> <p>R&amp;D projects that substitute for innovative activities in companies</p> <p>Engineering services</p>	<p>Employment of graduates by companies</p> <p>Conferences or events with university &amp; firm participation</p> <p>New firm formation by university members</p> <p>Joint publications</p> <p>Informal meetings, talks, communications</p> <p>Joint supervision of Ph.D. and Masters theses</p> <p>Training of firm members</p> <p>Mobility of researchers between universities &amp; companies</p> <p>Sabbatical periods for university members</p> <p>Collaborative research, joint research programmes</p> <p>Lectures at universities, held by firm members</p> <p>Contract research and consulting</p> <p>Use of university facilities by companies</p> <p>Licensing university patents by companies</p> <p>Purchase of prototypes, developed at universities</p> <p>Reading of publications, patents, etc.</p>	<p>Research partnerships</p> <p>Research services</p> <p>Academic entrepreneurship</p> <p>Human resource transfer</p> <p>Informal interaction</p> <p>Commercialization of property rights</p> <p>Scientific publications</p>

## Finding 10 good models

### Selection criteria:



- Most common approaches
- Those with more available information

## Models

1. Research collaborative projects
2. Innovation collaborative contracts
3. Spin off - entrepreneurship
4. Seminars and workshops taught by company members
5. Seminars and workshops taught by HEI experts
6. Joint supervision of students
7. Consultancy and engineering services
8. Personnel exchanges
9. Joint spread of knowledge
10. Philanthropic contributions by companies to HEI experts

Selection of five models

Method

Opinion survey

An **opinion survey** provides the weights of the classification criteria:

- **9 questions about** the information availability, benefits and management issues of the **pre-selected models**.
- The survey was distributed **among the experts** involved in this project and their **contacts**.
- We received **32 answers** from HEI experts of different countries and universities.

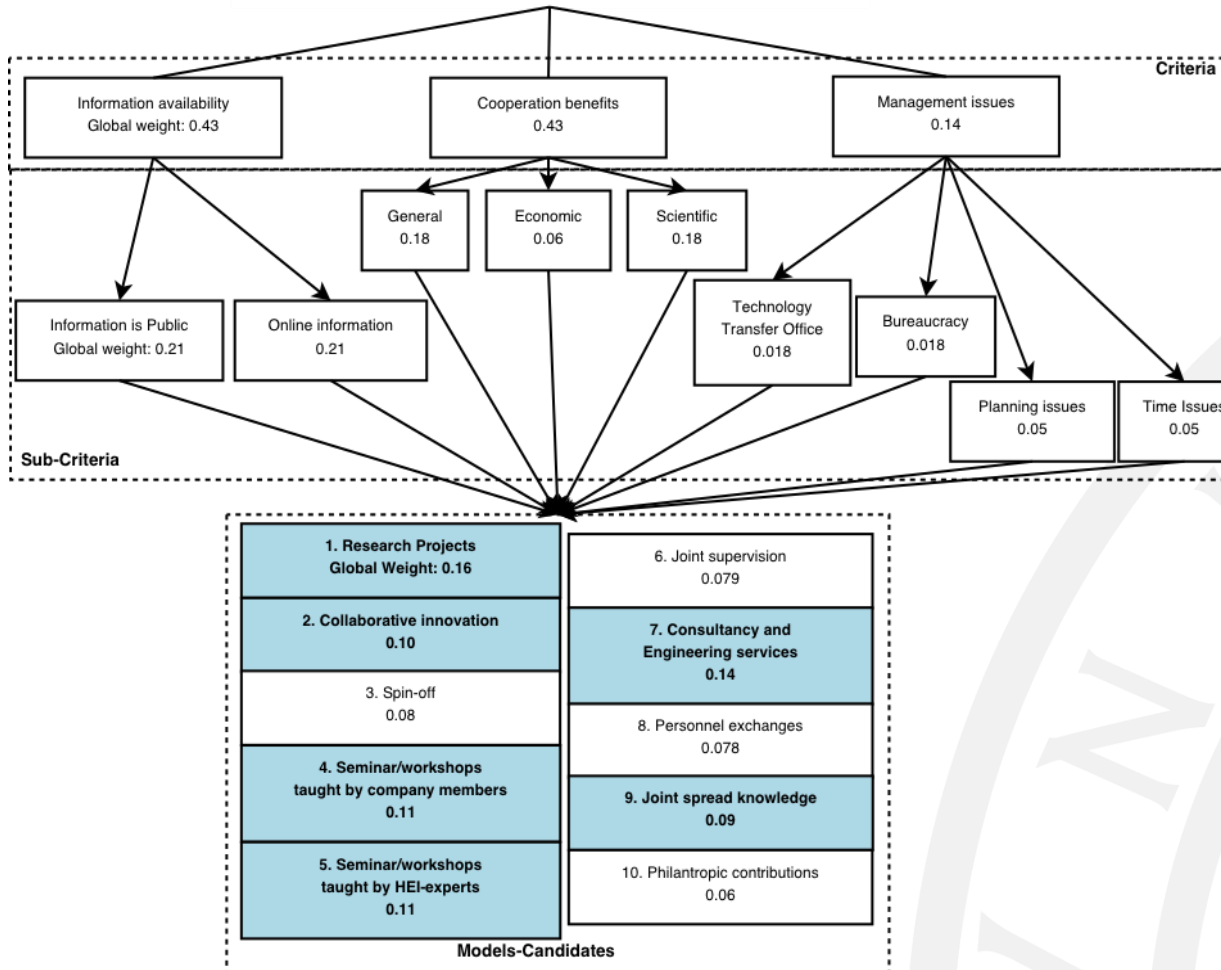


Selection of five models

Method

Analytical Hierarchy Process

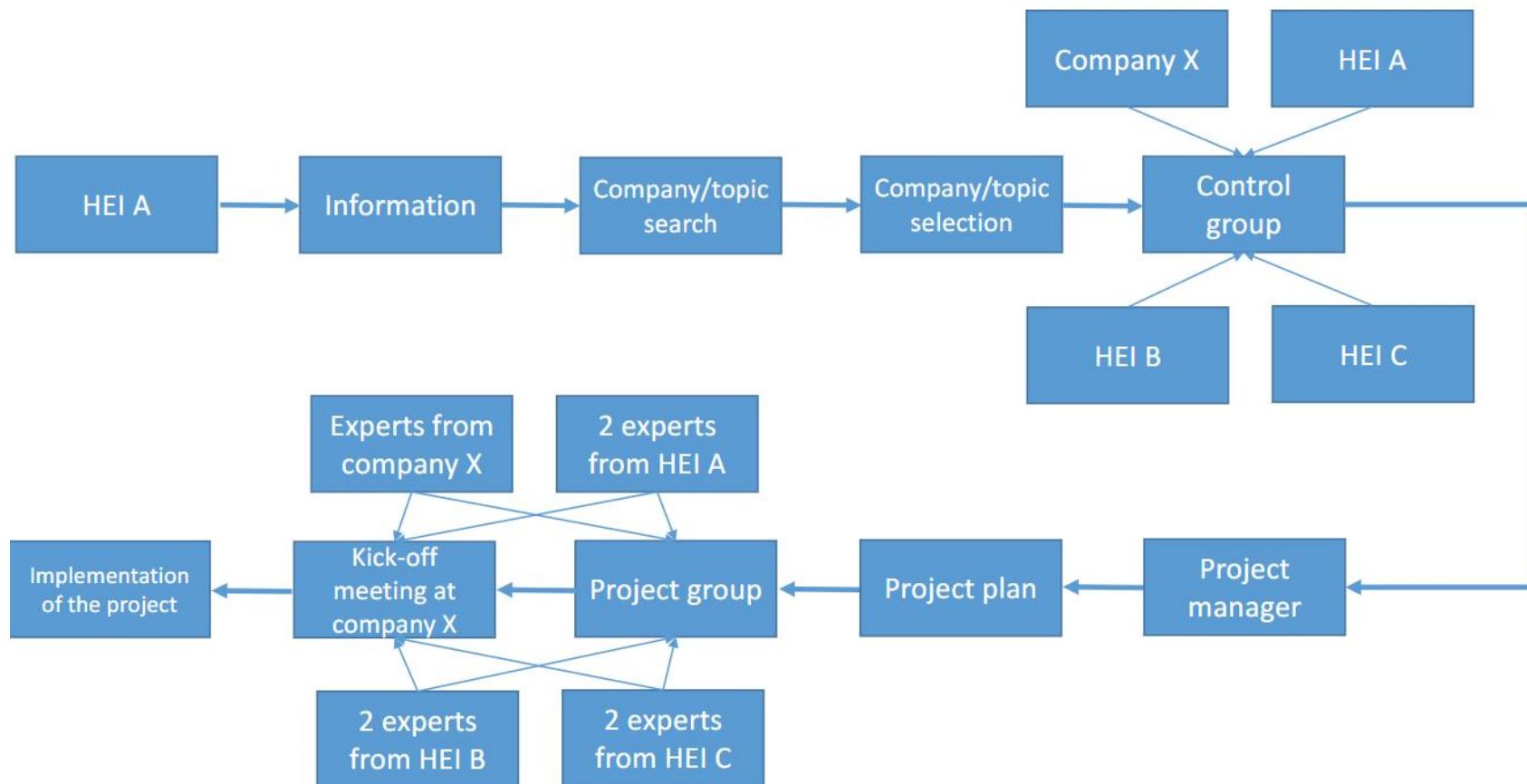
Selection of HEI Expert - company cooperation Models



**Results. Best Models:**

- 1 → Research collaborative projects
- 2 → Innovation collaborative contracts
- 7 → Consultancy and engineering services
- 4, 5 → Seminars and workshops taught by company members or by HEI experts
- 9 → Joint spread of knowledge

**HEIBus** MODEL: EXPERT REAL LIFE SOLVING PROBLEM





Research collaborative projects	Short-term and Long-term R&D collaborative projects financed by public or private funds.
Consultancy & engineering services	Product tests, projects review & management, and use of university facilities by companies
Seminar & workshops	Scientific and professional instruction taught by company-experts
Collaborative innovation	Research contracts that aim at developing innovative activities in companies
Joint spread of knowledge	At least one university researcher and one industrial researcher cooperate

- 1 Multilingual
- 2 Multidisciplinary
- 3 Virtual team work
- 4 Duration: three or four months
- 5 Collaborative Project financed by HEIBus

Company involvement in HEI education



## PROPOSAL FOR MODELS IDENTIFICATION

- 1.- Collaborations focused on the development of new educational programs or the revision of existing ones
- 2.- Collaborations focused on teaching and learning processes
- 3.- Collaborations focused on the transfer between studies and work life
- 4.- Collaborations focused on sponsorship initiatives by companies

## Detailing models features

<b>Main educational purposes</b>	Curriculum development and strategies to promote industrial engagement; rational goals and open system; human relations; internal processes; accreditation; integration of theory and practice in a current workplacement; progressive skill acquisition
<b>Role of company</b>	<p><u>Advisor</u> (new courses proposed; master thesis advice; companies provide definitions for students' research projects)</p> <p><u>Supervisor</u> in work placements; board membership consisting of a strong base of experienced, senior executives with a wide range of backgrounds and with demonstrated commitment to the school and the profession; trade committee used to approve the programmes</p> <p>To offer an apprenticeship contract for students</p>
<b>Role of HEIs</b>	To set learning objectives and approve host site; assist with student selection; monitoring and assessment
<b>Company's incentives</b>	Opportunity for companies to access expertise in the HEIs
<b>HEI's incentive</b>	Strong leadership by Heads who believed in the advisory board process;

**M1 → Industrial advisory boards (IAB)**

**M2 → Dual Vocational Education Training**

**Detailing models features**

**2.- Teaching and learning processes**

<b>Main educational purposes</b>	Integration of theory and practice; personal development; career exploration and development; professional socialization
<b>Role of company</b>	Supervision, evaluation
<b>Role of HEI</b>	Set learning objectives and approve host site; assist with student selection; monitoring and assessment
<b>Company's incentives</b>	To access to a highly-skilled workforce and cutting-edge academic research
<b>HEIs' incentives</b>	To establish long-term sustainable collaborations with business; to help build awareness of the added-value that university research can bring to industry and society at large; to help to improve recognition of the PhD qualification; to make sure doctoral students are well informed about all career opportunities

**M3 → Visiting Professors**

**M4 → Summer Schools**

**M5 → Ph.D Programmes (Company oriented)**

**Detailing models features**

**3.- Transfer between studies and work life**

<b>Main educational purposes</b>	To develop cross-cutting skills such as drawing-up CVs, one-to-one interview, good team-working skills and flexibility; to increase social skills; to increase capabilities to transfer know-how on practical knowledge to local partners
<b>Role of company</b>	Mentoring; supervision; evaluation
<b>Role of HEI</b>	Set host site; assist with student selection; monitoring and assessment
<b>Company's incentives</b>	To access to a skilled workforce
<b>HEIs' incentives</b>	To establish short and medium-term sustainable collaborations with business; to help build awareness of the added-value that university research can bring to industry and society at large

**M6 → Career fairs**

**M7 → Industrial mentoring Programs**

**M8 → Competitions and awards**

**Detailing models features**

**4.- Sponsorship initiatives by companies**

<b>Main educational purposes</b>	Foster student’s skills under the strategic lines of the companies and proximity approach between R&D lines of the HEI and companies
<b>Role of company</b>	Funders
<b>Role of HEI</b>	Assessment and manager of the facilities
<b>Company’s incentives</b>	Access to a skilled workforce and collaboration with companies alike
<b>HEIs’ incentives</b>	Availability of funding resources

**M9 → Students’ grants/scholarships**

**M10 → Sponsorship of Joint Laboratories at HEI**

Selection of the best models

Level involvement of companies in HEIs → low level (L), middle (M) and high level (H).

Models	Features				Involvement level for companies
	Model Type	Location	Internationalization	Accreditation	
<b>M1</b>	<b>Industrial advisory boards</b>	<b>USA</b>	<b>YES</b>	<b>ABET</b>	<b>H</b>
<b>M2</b>	Dual VET	Denmark	YES	Trade Union /Government	H
<b>M3</b>	<b>Visiting professors</b>	<b>UK</b>	<b>NO</b>	<b>YES</b>	<b>M</b>
<b>M4</b>	<b>Summer schools</b>	<b>Denmark</b>	<b>YES</b>	-	<b>L-M</b>
<b>M5</b>	PhD programmes	Denmark	YES	YES	M-H
<b>M6</b>	Career Fairs	USA	NO	-	M
<b>M7</b>	<b>Industrial mentoring programmes</b>	<b>UK</b>	<b>NO</b>	-	<b>H</b>
<b>M8</b>	Competition and awards	Spain	YES	-	M-H
<b>M9</b>	Students' grants	USA/SPAIN	YES	NO	L-M
<b>M10</b>	<b>Sponsorship (Joint Laboratories at HEIs...)</b>	<b>BELGIUM</b>	<b>YES</b>	-	<b>M-H</b>

## HEIBus MODEL

**Aim:** to find and test **flexible** ways to involve companies in education

### Common features among HEIs

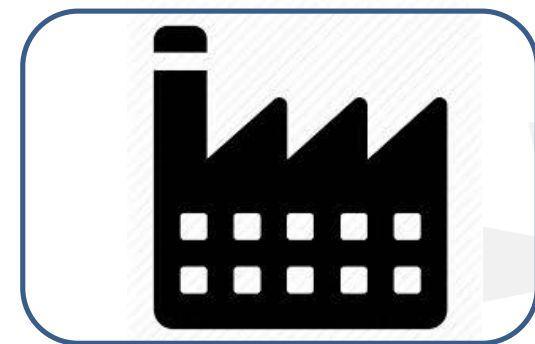
- Different students groups have been created
- Lecturers inform of this activity
- Lecturers contact with the companies (full, associated and external partners)
- Results are assessed at the beginning, in the middle and at the end of the studies

### Common activities

- **Tailored lectures** given by company representatives
- **Dedicated courses** by companies
- **Company visits/practices** activities
- Developing **bachelor projects**
- **Supervising** students (BSc, MSc, PhD)
- **Workshops**, where the students will meet with company representatives
- Preparing different kind of **student projects**



**S** Strengthen



BENEFITS

- ✓ Gain experience
- ✓ Improve motivation
- ✓ Development of attitudes
- ✓ Increase work-relevant competencies and skills
- ✓ Make students more employable
- ✓ Patents, contracts, JCRs and conferences
- ✓ Improve teaching

- ✓ Involvement in learning process
- ✓ Shape employment according to necessities
- ✓ Increase the number of patents
- ✓ Industrial PhDs
- ✓ Seminar courses.....

- ✗ Non-enriching work
- ✗ Only observing activities
- ✗ Difficult to manage

