



The International Maritime Transport and Logistics Conference

“MARLOG 12”

**Sustainable & Innovative
Technologies**

Towards a Resilient Future

12 - 14 March, 2023 Alexandria - EGYPT



STRENGTHENING UNIVERSITY THIRD MISSION THROUGH EDUCATION – ENTERPRISE COOPERATION: THE VALUE OF INNOVATION ECOSYSTEMS

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STRENGTHENING UNIVERSITY THIRD MISSION THROUGH EDUCATION – ENTERPRISE COOPERATION: THE VALUE OF INNOVATION ECOSYSTEMS

- Specifically, the paper presents the results of a qualitative research, which investigated the views of different professional categories on optimizing cooperation in innovation ecosystems.
- The paper relates the **third mission of universities to innovation ecosystems** and discusses the specificity of the EEC in Romania, analyzing in depth the already existing experiences and responsibilities that have the potential to enhance innovation in higher education institutions and to provide concrete directions for operationalizing the EEC.

Industry 1.0

Energy Sources:

- Steam
- Water

*High volume of work force



Industry 2.0

Energy Sources:

- Petrol
- Electricity

*The emergence of the assembly line concept

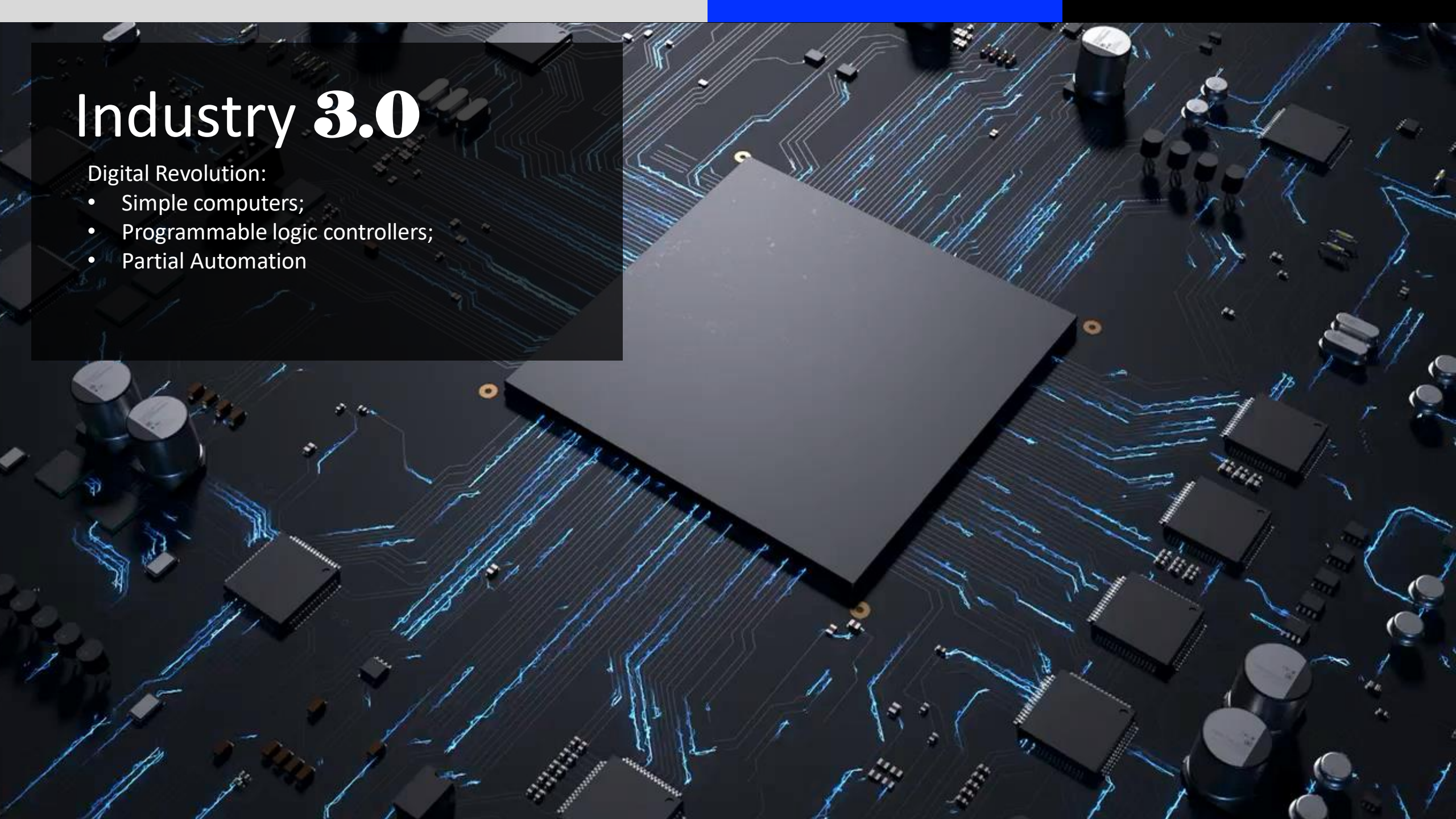
*Less workforce needed



Industry 3.0

Digital Revolution:

- Simple computers;
- Programmable logic controllers;
- Partial Automation



Industry 4.0

- Adoption of digital technology
- Interconnectivity
- IOT, AI, Robots, Drones;



Education – Enterprise Cooperation: Challenges and Opportunities

- The 4th Industrial Revolution (or Industry 4.0) is already having an effect on the labour market.
- The challenges are real and should not be underestimated, but there are many actions that can influence adaptation to the dynamics of the world.

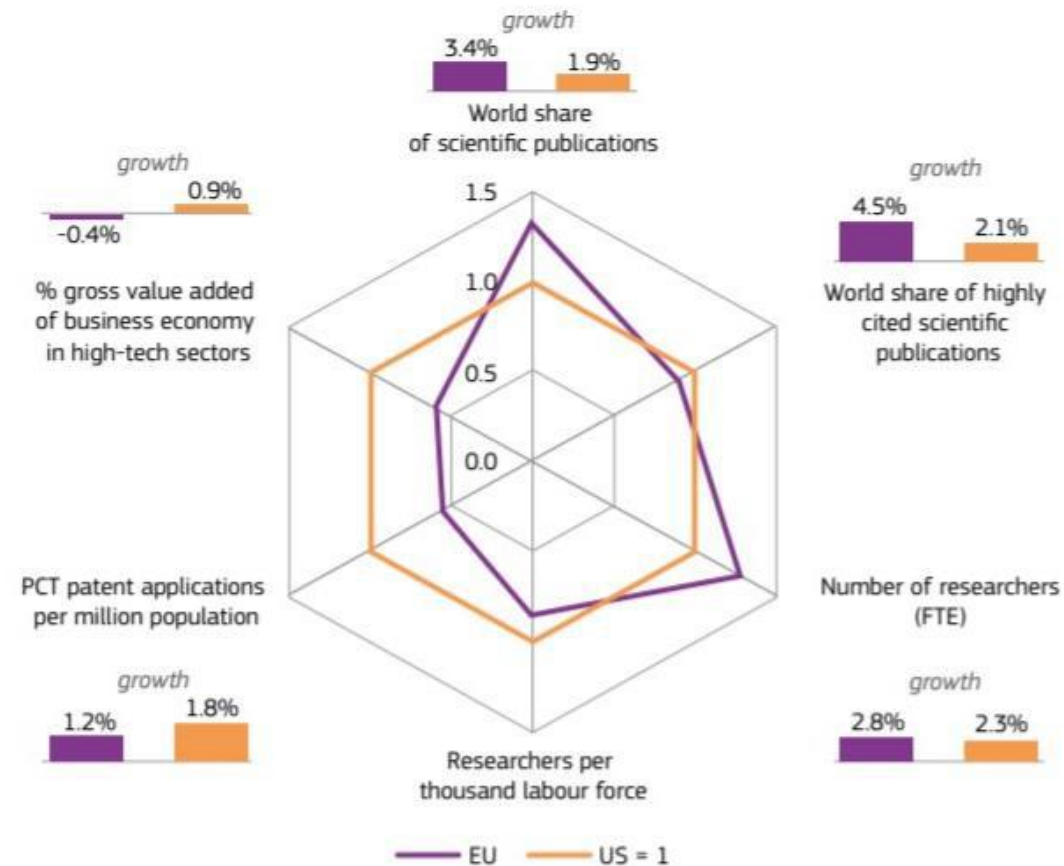


Figure 1 : Innovation performance - a comparative perspective (Lamy et al., 2017)

**Higher education
institutions - active
players in
socio-economic
ecosystems**

There are many reasons why universities can be considered innovation leaders. The mechanisms that interconnect these rationales are associated with the three missions that universities can assume:

- (1) human capital formation, understood as the primary mission;
- (2) contribution to the development of knowledge through research activities (second mission);
- (3) knowledge and technology transfer to industry and society through technology transfer (tertiary mission).

Governments and companies view universities as responsible actors to fill in missing links, given that these organizations are impartial, have long-term strategies and are less driven by commercial interests (European University Association, 2019, p. 9).

Education – Enterprise Cooperation: Challenges and Opportunities

The most important skills in engineering are:

- critical thinking,
- holistic thinking,
- systems thinking,
- entrepreneurial thinking,
- global mindset,
- cultural agility
- continuous learning capacity.

All these skills cannot be imitated by (networks of) intelligent machines and are unique to humans. To these can be added other skills that can be developed within the university curriculum and that can be equally important:

- the ability to design,
- the data-driven approach,
- the ability to build coalitions,
- the ability to lead,
- and the ability to identify strengths and see things through to completion (Kamp, 2019).

These competencies fall into the following categories:

- (1) advanced communication and negotiation skills;
- (2) interpersonal and empathy skills;
- (3) leadership and management skills;
- (4) entrepreneurship and initiative-taking;
- (5) adaptability and continuous learning skills;
- (6) teaching and training skills.

They play an increasingly critical role in Science, Technology, Engineering and Mathematics (STEMpathy).

Education – Enterprise Cooperation(EEC): Challenges and Opportunities

EEC = Developing new products and services from research output and commercializing them through entrepreneurial ventures have been taken up by many HEIs with a view to make useful contributions to the economy and thereby improving the quality of life in the community.

Universities fulfil several roles in educating and training students to create a sustainable society:

1. **didactic role**: education contributes to the evolution of the whole human society and enables adaptation to technical transformations;
2. **collaborative role**: the strength of universities is the capacity for interdisciplinary research and teaching, and the challenge is to strengthen the links between research and education and between disciplines;
3. **Scientific evidence-based knowledge role**: universities have a key role in transmitting scientifically proven knowledge and insights;
4. **Measurement and evaluation role**: universities can measure the effects of different SDG-related actions;
5. **Advocacy role**: higher education institutions need to continuously advocate the importance of implementing the global goals.

Education – Enterprise Cooperation(EEC): Challenges and Opportunities

Entrepreneurship and innovation are important factors that create the highest added value for local and regional development, and the university that interacts, co-creates and achieves a far-reaching impact on regional, national and global development has been called a "**fourth generation university**". This university model involves creating its own environment both socially and economically, and in addition to its traditional educational role of providing suitably qualified human capital through teaching (**the first mission**), its **second mission** is to conduct scientific and academic research (and to base its educational process on such research) and its third and expanding mission is to create value through the transfer of knowledge and technology from academia to industry and society (Pawłowski, 2009). **In this dynamic, cooperation between universities and socio-economic partners is essential.** Thus, the present study aimed to investigate the state of the art of EEC in Romania.

- In this research, we started from the premise that, in order to determine a change or transformation of an educational system (university, in our case), a key role is played by the feedback and support of those involved in its operation, namely the practitioners.
- However, the research does not want to focus strictly on academics (whether we are referring to managers of higher institutions or teaching staff/researchers).
- On the contrary, the approach is much more complex through the prism of the relationships within the innovation quadruple helix with the other key actors.
- Thus, we also want their opinion, as external stakeholders, on the performances of higher education institutions, in order to have a broader perspective, both internal and external.



Research methodology

The aim of this research is to provide an in-depth perspective on the missions and roles of universities in socio-economic ecosystems, with a focus on the relationship with socio-economic partners.

To achieve this goal, the study was designed to:

- describe the types of cooperation between higher education institutions and various stakeholders in Romania;
- identify barriers to education-enterprise cooperation (EEC);
- propose a comprehensive framework for identifying factors and mechanisms supporting EEC.

Research methodology

Materials

- 20 computer-assisted, semi-structured individual interviews have been carried out between February and April 2021.
- The interview was based on an interview guide. Data were obtained on the respondent's position in the organisation to which he/she belongs, the field in which he/she works and whether he/she has work experience in other fields. The second section focused on investigating views on the *Education-Enterprise Cooperation (EEC)*, followed by testing the *EEC* profile and collecting recommendations on the implementation of the profile at national and regional level.

Procedures

- Individual interviews were organized online, using the computer-assisted web interview (CAWI) method on the Zoom platform.

RESEARCH METHODOLOGY

Figure 2 synthesizes the socio-demographic profile of the participants affiliated to higher education institutions. Most of the participants have a solid international working experience and reported they have participated in international mobility stages, research projects and have had visiting professor or postdoctoral scholarships. One of the respondents is also affiliated with a university in the United Kingdom. Their experience in leadership positions have allowed them to carry out activities together with business stakeholders or other types of external partners.

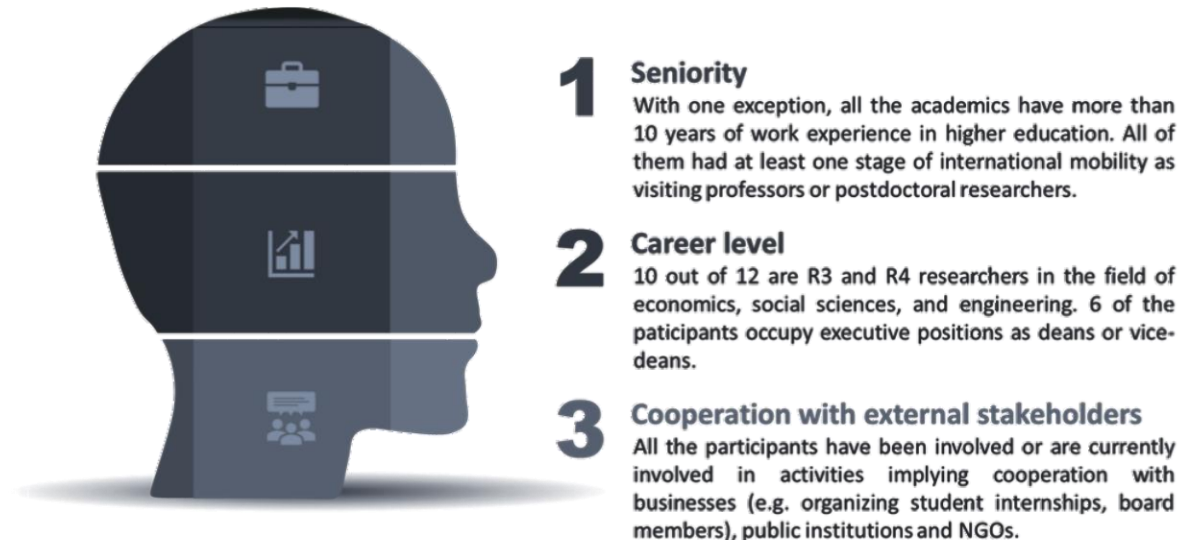


Figure 2: Academics' socio-demographic profile

RESEARCH METHODOLOGY



Figure 3: Business representatives' socio-demographic profile

Figure 3 analyses the socio-demographic profile of the business representatives. Their work experiences are relevant in terms of university-business cooperation. Therefore, they have engaged in a wide range of activities with universities: talent recruitment and inception programmes for students and graduates; research and development projects jointly developed with universities, organizing academic events (e.g. conferences). The participants in this category reported themselves and their organizations as active initiators of business-university cooperation.

RESEARCH METHODOLOGY

- 1 Seniority & Career Level**
 All the participants in this category have more than 10 years of work experiences. 2 out of 3 occupy executive positions.
- 2 Activity Profile**
 The NGO representatives engage in programme and project management activities related to open government, open education, re-skilling and up-skilling, NEET and vulnerable groups education and training.
- 3 Cooperation with Education Institutions**
 All the participants have partnered with secondary and higher education institutions.



Figure 4: NGO participants' profile

RESEARCH METHODOLOGY

- 1 Seniority**
The interviewees working in Government and Public Institutions are senior counselors, with more than 20 years of work experience.
- 2 Career level**
The two participants hold lecturer and full professor positions in Romanian universities in the field of economic and social sciences.
- 3 Cooperation with external stakeholders**
The nature of their professional responsibilities imply an intense cooperation with HEIs and pre-university education institutions, being involved in project management and lifelong learning training activities.

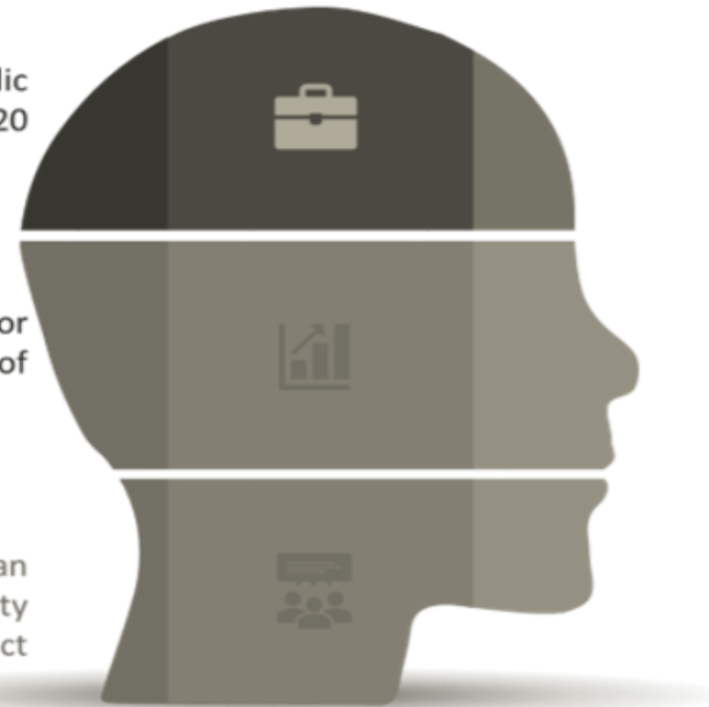


Figure 5: Government and Public Institutions Participants' Profile

Research methodology

Participants

- **20 professionals** were interviewed (*Non multa, sed multum*), purposefully selected based on their affiliation to the following categories of organizations: academia (12 participants), business (3 participants), government and public institutions (2 participants), civil sector (NGOs, 3 participants).
- In terms of gender, the selected group was unbalanced (only 6 female participants).
- Almost all respondents were **senior professionals** in their respective field, with over 10 years of work experience.
- 8 out of 20 participants occupy an **executive position** in their organizations.

Results and Discussion

Based on the participant's experiences, a number of three cooperation areas have been identified in education, research and valorization of research results, and management.

Given the exploratory nature of the study, these activities are inexhaustive. As all the participants argued, there is room for deepening and extending EEC in all those fields.

EEC areas	Examples of EEC activities
1. EEC activities in education	<ul style="list-style-type: none"> 1.1 (Paid) Internships and placements in companies and public institutions. 1.2. Curriculum co-design (e.g. designing study programmers based on specific technologies provided by industry players). 1.3. Lifelong learning programmers developed by HEIs for external stakeholders / professionals. 1.4. Co-teaching (e.g. co-lecturing, workshops organized in partnership with businesses and NGOs; joint training and open courses); 1.5. Students tutoring 1.6. Cotutelle dissertations 1.7. Recruitment activities (e.g. career fairs organized and hosted by universities, company presentations) 1.8. Scholarships for students 1.9. Student competitions
2. EEC activities in research and valorization	<ul style="list-style-type: none"> 2.1. Joint research projects 2.2. Research laboratories supported by industry partners in universities. 2.3. Incubation labs 2.4. Providing access to research infrastructures to companies 2.4 Patents
3. EEC activities in management	<ul style="list-style-type: none"> 3.1 Joint participation in clusters and boards

Results and Discussion

Based on the participant's opinions, five categories of barriers have arisen:

- (1) misaligned goals;
- (2) insufficient financial resources;
- (3) skills mismatch;
- (4) difficulties in partnership building, and finally;
- (5) the lack of legislation.

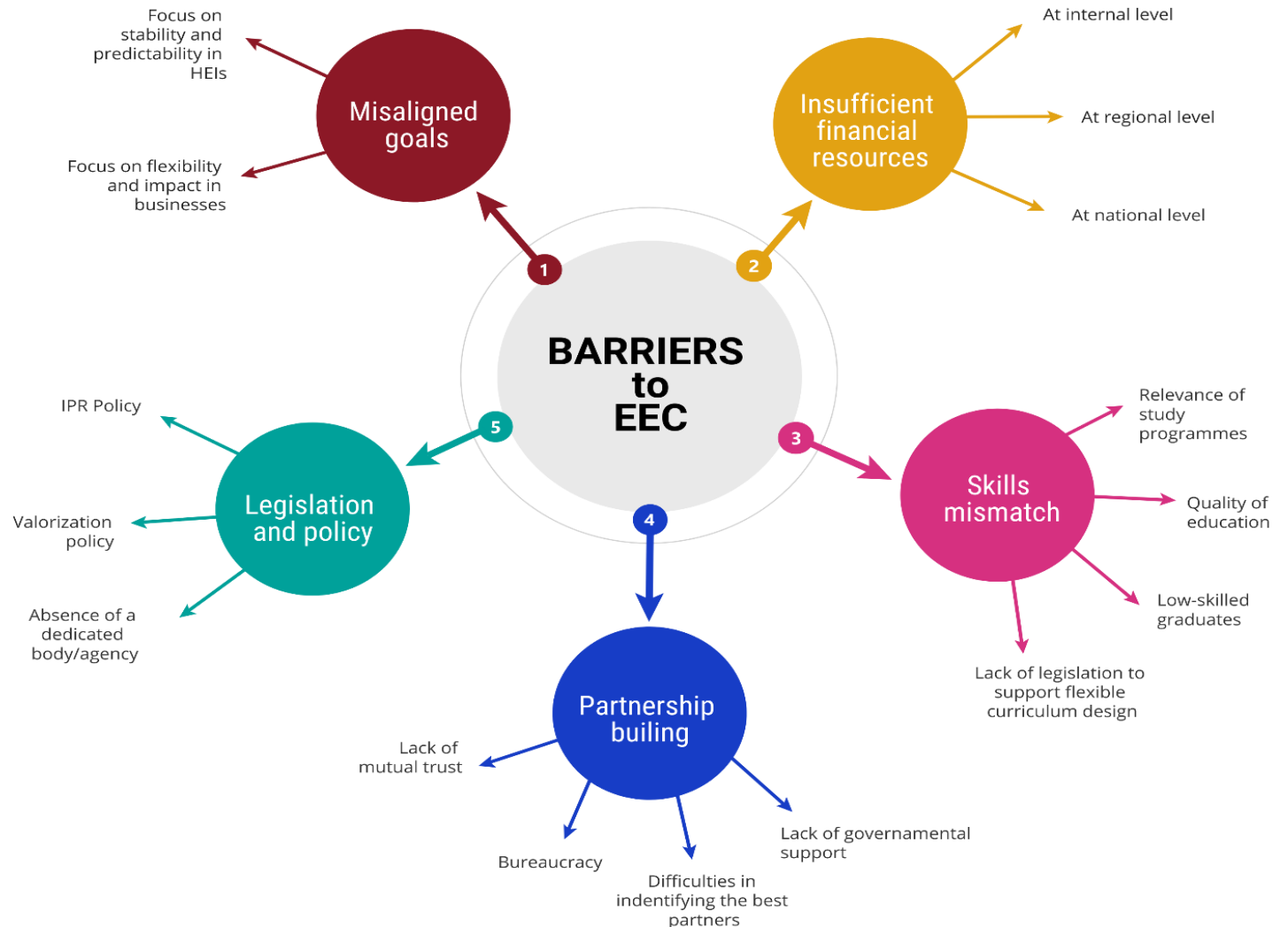


Figure 6 : Barriers to Education-Enterprise Cooperation

Results and Discussion

The creation *European Universities* as a result of the European Commission's initiative is a relevant example from the perspective of innovation, cooperation policies and curriculum design.

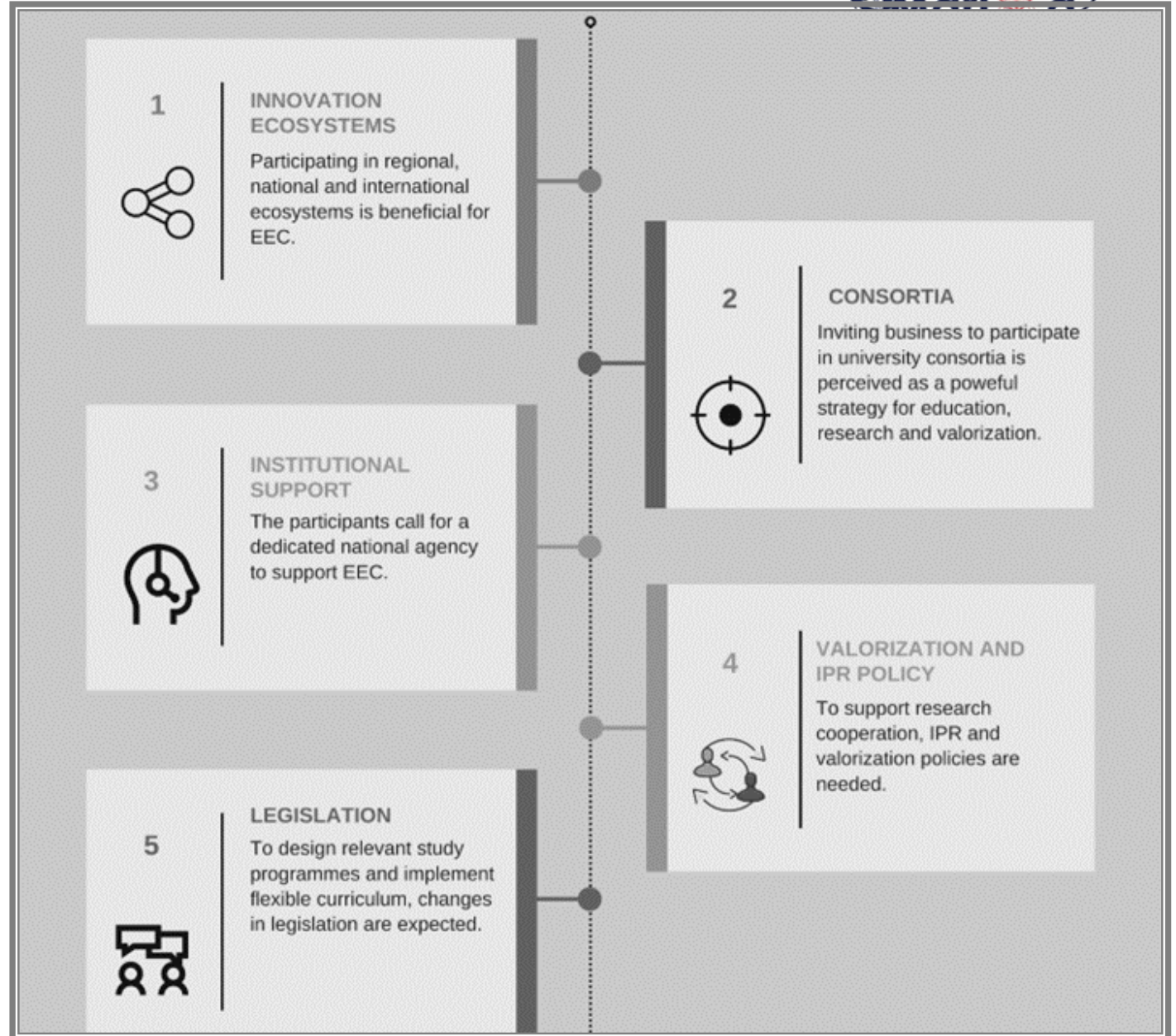


Figure 7 : Drivers and mechanisms to support EEC

Conclusions

- The results showed that, given the right circumstances, EEC in Romania could positively work and have an impact on both processes and outcomes. Particularly, both HEIs and businesses are starting to realize that a multidimensional cooperation could be beneficial for all parties involved.
- As expected, HEIs are not seen as innovation and entrepreneurship providers. Romanian academics are involved in a variety of cooperation activities with both private and public sector, but, in most of the cases, those are individually initiated. Thus, the respondents from Academia perceive themselves as active initiators. In this context, they identify the need for a systemic approach to business-university cooperation, financially and institutionally supported. Some of the private sector representatives stated that they are open to partner with HEIs for local and regional development purposes.
- The directions for engaging in partnerships with universities merit further investigation, suggesting possible short- and medium-term measures to make it work in line with the real needs and opportunities uncovered in the stakeholder consultation work.

Upskilling is not simply a matter of teaching people how to use a new device. That device may be obsolete by next year. The upskilling experience involves learning how to think, act and thrive in a digital world that is sustainable over time.

- For example: The growing use of surveillance devices is forcing us to think differently about ethics and governance. Advances in genetic engineering and artificial intelligence are raising questions about the nature of being human. The 'digital divide' between rich and poor has led us to consider what constitutes a fair economy. Social fracturing has been exacerbated by digital media, causing us to question the credibility of information. And sooner or later, the pressures of climate change and advances in energy technology and mobility will force us to rethink our approaches to environmental sustainability.

CONCLUSIONS





Thank You!