

University-SME Collaboration: Multi-disciplinary R&D & understanding institutional and cultural differences

What will you learn in this module?

In this module you will learn about ...

- Different types of HEI-SME collaboration
- What motivates HEI-SME collaboration?
- Facilitators of collaboration
- Collaboration challenges
- Support mechanisms for HEI-SME collaboration

Different types of HEI-SME collaboration

University-business cooperation (UBC) is 'any sort of interaction between universities and business for mutual benefit' (Davey, et al., 2011). These interactions can take place in teaching, research, valorisation, or are part of management activities. These interactions can be classified under the following categories (Seppo & Lilles, 2012):

- Curriculum development and delivery
- Lifelong learning
- Student mobility
- Academic mobility

- Commercialization of research and development (R&D) results
- Collaboration in R&D
- Entrepreneurship
- Governance

UBC in all aspects, supports the generation of new ideas, projects, products, services and it creates new opportunities. Therefore, exchange in knowledge, talent and technologies helps both sides to address their resources needs and limitations. In table 1 outlines the differences in which way HEIs and SMEs seek to collaborate.

Ways in which HEIs seek to collaborate	Ways in which SMEs seek to collaborate
HEIs often collaborate with SMEs which offer services in online course development.	Access to non-monetary resources (Ankrah & Al-Tabbaa, 2015)
HEIs are able to access information on industry problems (D'Este & Perkmann, 2011).	Cutting-edge scientific knowledge in early stage (Kock et al., 2000)
Business expertise, industry knowledge, and business sector (R&D) facilities (Tartari & Breschi, 2012)	University facilities (Schartinger et al., 2002).
Industry problem solving	Businesses benefit from the problem-solving ability of academia (Van der Sijde, 2012; Lee, 2011)
Skills alignment and development of students (Ginzburg & Houli, 2013; Muscio & Vallanti, 2014)	Applicable knowledge from universities (Bruneel et al., 2010).
Profit from upskilling and retention of existing staff	New products and services
Professional consultancies for writing project proposals and legal expertise, which some universities do not have in house (this differs between national contexts)	Technologies and equipment

Table 1: How HEIs and SMEs seek to collaborate

**Tip for HEIs**

HEIs often collaborate with SMEs which offer services in online course development. The needs of HEIs differ across regions and thus so do their priorities and their motivations for collaboration.

- Exchange Funding

See figure 1 on the following page for a more detailed overview of motivations.

It is important to realize that the differences in motivations for collaboration are directly connected to the differences in historical, cultural and institutional norms and experiences.

Suggested readings

A framework to improve university-industry collaboration - [link](#) (paper)

Focus: A literature review of best practices, barriers to collaboration and various models proposed in the past for successful UBC.

3 ways to nurture collaboration between universities and industry - [link](#) (website)

Focus: An article describing how UBC can be fostered.

**Tip for SMEs**

SMEs particularly benefit from UBC through:

- Commercialization of product
- Creation of spin offs & start-ups
- By-products resulting from UBC
- Development of new business models
- Improvement of products or services.

Tools

Five reasons why universities collaborate with industry – [link](#) (video)

This video highlights five benefits most often cited by research leaders for UBC..

Suggested readings

Industry and university collaboration: how partnership drives innovation – [link](#) (webpage)

An article detailing examples of UBC and the benefits for stakeholders involved.

Why Companies and Universities Should Forge Long-Term Collaborations – [link](#) (article)

Focus: Kenneth R. Lutchen describes why long-term UBC should be pursued.

What motivates HEI-SME collaboration?

There is a close and complex relationship between individual and organizational motivators. Motivators of both individuals and organisations to undertake HEI-SME collaboration include:

- Continuous learning, reflection and in depth understanding of problems and development of potential solutions.
- Social impact
- Excellence, relevance and credibility
- Generate new contacts, widen professional networks and in general raise its social capital

Drivers and facilitators of collaboration

Drivers of UBC enable HEIs and SMEs to collaborate more easily and efficiently. This means that lack of these facilitators in the environment will pose challenges for initiating and maintaining collaborative projects. The next section outlines

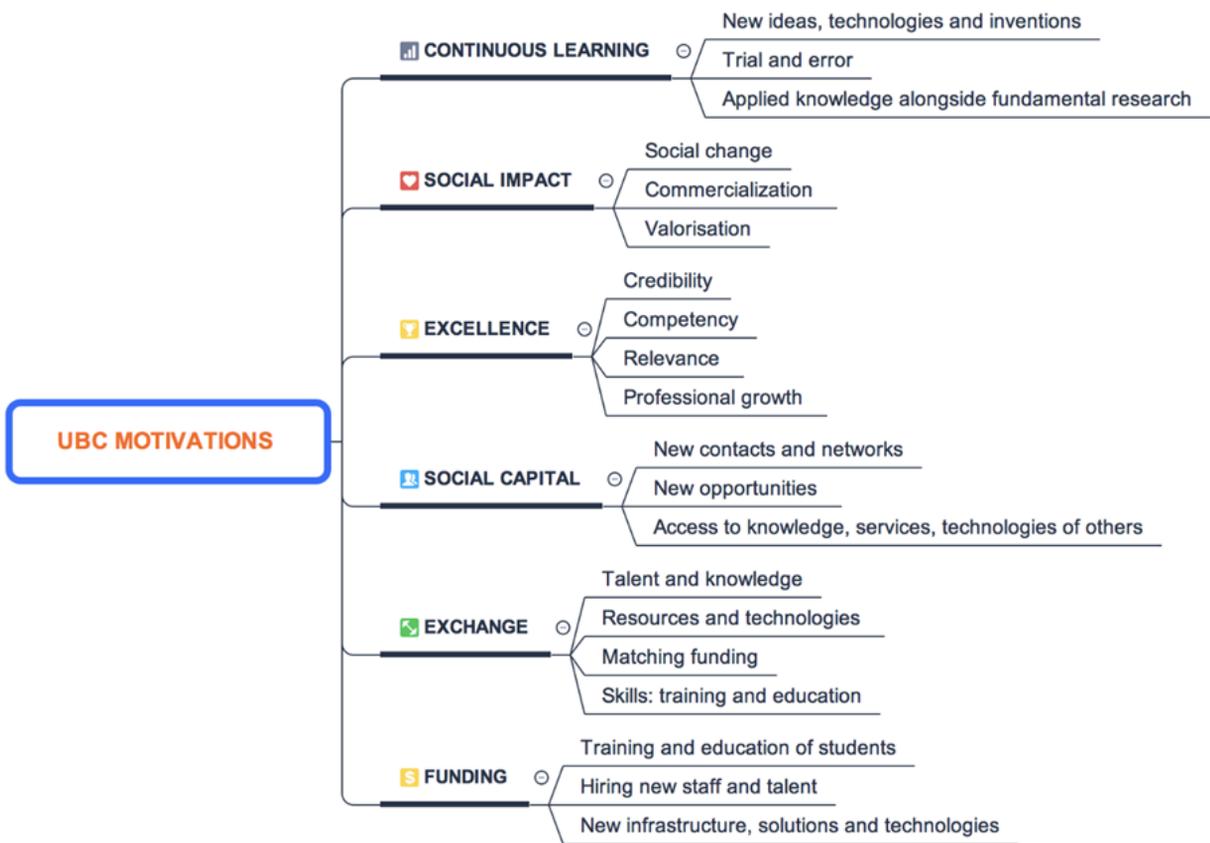


Figure 1: UBC motivations for HEIs and SMEs (Unite for Horizon Europe Report on University-SME collaboration in Europe, 2021).

the different facilitators of collaboration and their effects (Demir et al., 2021):

Commitment: The lasting aspiration to build and maintain UBC, allowing both parties to reach their individual and common aims and objectives (Moorman et al., 1992).

Communication: The basis for information exchange and knowledge sharing

Trust:Crucial for building and maintaining collaboration (Bruneel et al., 2010)

Leadership: The role of leadership is to actively support the engagement (Galán-Muros et al., 2017)

Boundary spanners: Can create the bridges between the SME and HEI

Networking opportunities: Can support the development of trust between HEI & SME

Training programs on UBC: ‘Action learning’ and ‘organisational development’ elements in such programmes contribute to the absorptive capacity and engagement capabilities in SMEs (Kurdve et al., 2020).

Level of R&D and innovation intensity: Higher R&D and innovation intensity means there are already existing networks of joint collaborations (e.g. clusters, innovation alliances, etc.)

Organisational, cultural and social proximities: Enable interactions between similar organisations

Reputation: Can be built on past UBC experiences but also in education.

Quality of education and training: Greater support to students and inner school system is crucial as well as fostering entrepreneurial and engaged education.

Field of study: Influence the HEI’s ability to engage, as engineering academics engage in formal research activities, including joint and contract research, far more than social sciences and humanities researchers do, who engage more in informal activities with industry partners.

The key facilitators for cooperation between HEIs and business are very similar for each stakeholder group, as you can see in Table 2.

Geographical proximity is not necessarily a condition for HEI-SME engagement (O’Reilly & Cunningham, 2017). However, it allows for easier interactions within a region. Certain countries have profiled themselves as experts in specific fields.



Tips specific for SMEs

For successful engagement, SMEs require (Rosli, 2018):

- A boundary spanner that can create the linkages between SME and HEI, as well as within the SME itself.
- A committed SME leadership that can allocate the resources and encourages open communication.
- A strong relationship between the university and SMEs. There should be trust, cognitive proximity, open discussions, and acknowledgement and respect for the different roles and responsibilities



Tip for HEIs

Universities can support trust building by creating formal and informal networking opportunities for SMEs. Universities can also support SMEs through promoting, recognising, and valuing partnerships with SMEs.

Suggested readings

Boundary Spanning– [link](#) (article)

Focus: This article describes boundary spanning, best practices related to the topic and how to span boundaries in an organization.

How to apply for European funding as HEI-SME consortia – [link](#) (article)

Focus: This article addresses what drives HEI-SME consortia to apply for European funding, the skills and capabilities needed, the main challenges, and the success strategies.

	Academics collaborating with business	HEI managers	Business collaborating with higher education
1	Existence of mutual trust	Existence of mutual trust	Existence of mutual trust
2	Existence of a shared goal	Existence of a shared goal	Existence of a shared goal
3	Existence of funding to undertake the cooperation	Existence of funding to undertake the cooperation	Existence of mutual commitment
4	Existence of mutual commitment	Existence of mutual commitment	Existence of funding to undertake the cooperation
5	Interest of business in accessing scientific knowledge	Prior relation with the business partner	Prior relation with the university partner

Table 2: The main facilitators for cooperation between HEIs and businesses (source: Davey et al., 2018)

Collaboration challenges

Challenges that UBC practitioners from HEIs and SMEs equally face are the following:

- Mismatch in: 1) Time-orientation, 2) Strategic orientation, 3) Focus and priorities.
- Wrong incentives related to: 1) Career advancement in academia, 2) Quantification, 3) Valorisation.
- Lack of: 1) Time 2) Organizational capacities, 3) Financial resources, 4) Talent.
- Not enabling policy and regulatory environment.

Time is overall the biggest challenge to overcome in HEI-SME collaboration. Both HEI and SME representatives need to take time from their core activities to engage in collaboration. The section below outlines the challenges to HEI-SME collaboration and their effects (Demir et al., 2021).

Time restrictions to be able to perform UBC:

Academics at HEIs and or SME representatives may not be allocated sufficient time to find partners, undertake negotiations and other tasks required to build the consortium and apply for UBC funding.

Difference in timeframes: SMEs consider processes of academic institutions as too slow and perceived time horizons inside HEIs as to be detached from those dynamics inside the world of business.

High level of bureaucracy: This costs a lot of time, especially for SMEs, and negatively impacts initiation, creation and implementation of UBC initiatives in general and European funded projects.

Difference in strategic orientation: HEIs (including EU funded projects) are long-term oriented as new lines of research and innovation require lengthier periods of time for realization, whereas SMEs focus on capturing value through short- and medium-term targets to be competitive and financial solvent.

Difference in focus and priorities: This is related to strategic orientation and is especially evident when expectations and desired outcomes from UBC and EU funded projects are investigated.

Career development incentives in the higher education systems: These incentives do not support social engagement or industrial transfer. They mostly foster publications efforts in academia.

Universities neglect the social reality and especially the market needs: This is due to lack of engagement.

HEIs usually lack the ambition to access the market: Which would increase interest from international investors and generate new opportunities usually not generated by “regular” HEI activities.

HEIs lag behind in cutting edge research and finding suitable socio-technological solutions: SMEs find that such neglect of the social and market needs causes this lag.

A mutual unawareness and inexperience in working in/with different sectors: HEI representatives do not have clear understanding of the business environment, SMEs showcase disapproval of how academia operates.

Communication is scarce and ineffective: The main reason for this problem is the lack of training in UBC but also the fact that small number of people have actual experience working in academic and business settings.

Risk and profit sharing in technology/knowledge transfer are problematic: Researchers highlight the value of the idea and solution they developed, while business face risks when investing in application of that solution on the market.

Finding suitable partners is challenging: Especially because UBC entails collaborative activities between distinctive types of organizations from

different sectors.

Finding current, up-to-date information is challenging: Sometimes SMEs are brought into consortiums without proper insight into what such participation entails. Issues may arise due to lack of awareness of legal conditions, administrative and reporting requirements and obligations that continue beyond the lifetime of a project.

Lack organizational capacities, particularly in staff and expertise in UBC and European funded projects: Particularly large projects are challenging for SMEs as they do not have capacities to successfully engage. For example, UBC requires regular meetings, but these events directly take staff from SMEs' regular business operations.

Missing cultural and language skills: As UBC and European projects often include international cooperation, understanding different national contexts is useful as well as the necessary language skills, particularly English.

Lack of financial resources: Not all universities allocate sufficient funding for development and implementation of joint projects and financial issues are more problematic on the SME side since universities often receive public funding and/or generate income themselves through other activities.

Co-financing requirements in most grants are challenging for SMEs as they would appreciate higher support: SMEs may get *some* commercial benefit or competitive advantage at end of the project, in reality, this usually takes a long time and additional investments from the company.

Not enabling policy and regulatory environment: Existing funding programs are predominantly geared towards large-scale industrial research, in which majority of SMEs and small universities cannot participate. This means that funding instruments are more attuned to the bigger companies (and universities).

Support mechanisms for HEI-SME collaboration

Support mechanisms can be grouped into 4 categories:

1. Strategic
2. Structural
3. Operational
4. Policy intervention mechanisms

Strategic mechanisms

These include **documented mechanisms**, these are documents such as the mission, vision, and strategy (Ssebuwufu et al., 2012) and **implementation mechanisms**, which are a commitment to these documented strategies (Davey et al., 2011).

Tips specific for SMEs: There are two types of strategies (Bekkers & Bodas Freitas, 2008) focused on adopting (1) interdependent knowledge through collaborative and contract research and (2) systemic knowledge (through patents, licencing, etc.).

Structural mechanisms

There are 3 types of structural mechanisms: **people-based mechanisms**, such as board-level position for UBC, **office/centre-based mechanisms**, such as technology transfer offices (Markman et al., 2004), or career offices (Davey et al., 2011), and **programme-based mechanisms**, such as programmes facilitating interaction between HEI and industry (Ponomariov & Boardman, 2008).

Operational mechanisms

These are actions taken to support collaboration and must be aligned with the strategy of the organisation. These include **communication and exchange** activities, **linking and support** activities, **training and seminars**, and **information session and forums** on UBC.

Policy intervention mechanisms

These include economic and financial mechanisms, such as funding schemes, grants, subsidies, etc., regulatory mechanisms, such as laws and regulations, and other mechanisms that are non-coercive, such as government programmes. These mechanisms allow collaboration to occur and also generate development in specific sectors and move the economy in a particular direction.

An example is how the USA provided a financial commitment through Defense Advanced Research Projects Agency to create the Internet. Today, the USA gives financial commitment in biotech system over decades. Such commitments create a facilitative environment for people to invest over time, not just financially, but in terms of their careers too.

Suggested readings

Digital Intervention to UBC I: Online Network Platforms as Support Mechanisms to UBC – [link](#) (article)

Focus: How online platforms can support UBC and examples where such platforms are used.

References

- Ankrah, S. N., & Al-Tabbaa, O. (2015). Universities-Industry collaboration: A systematic review. SSRN Electronic Journal. Published. <https://doi.org/10.2139/ssrn.2596018>.
- Bruneel, J., D'Este, P., & Salter, A. (2010). Investigating the factors that diminish the barriers to university– industry collaboration. *Research Policy*, 39 (7), 858- 868.
- Davey, T., Baaken, T. & Galán Muros, V. (2011). *The State of European University-Business Cooperation. Science- to-Business Marketing Research Centre, Münster University of Applied Sciences.*
- D'Este, P., and Perkmann, M. (2011). Why do academics engage with industry? The entrepreneurial university and individual motivations. *Journal of Technology Transfer*, 36(3), 316-339.
- Galán-Muros, V., van der Sijde, P., Groenewegen, P., & Baaken, T. (2017). Nurture over nature: How do European universities support their collaboration with business?. *The Journal of Technology Transfer*, 42(1), 184-205.
- Ginzburg, S., & Houli, E. (2013). Collaboration between the Academic World and Industry. *Tefen Tribune*, Winter Issue, 19-22.
- Kock, N., Auspitz, C. and King, B. (2000). Using the web to enable industry—university collaboration: an action research study of a course partnership. *Informing Science Special Series on Organizational Learning*, 3(3), 157-166.
- Kurdve, M., Bird, A., & Lage-Hellman, J. (2020). Establishing SME–university collaboration through innovation support programmes. *Journal of Manufacturing Technology Management*.
- Lee, K. J. (2011). From interpersonal networks to interorganizational alliances for university–industry collaborations in Japan: the case of the Tokyo Institute of Technology. *R&D Management*, 41(2), 190-201.
- Markman, G. D., Gianiodis, P. T., Phan, P. H., & Balkin, D. B. (2004). Entrepreneurship from the Ivory Tower: Do Incentive Systems Matter? *Journal of Technology Transfer*, 29(3-4), 353-364.
- Moorman, C., Zaltman, G. and Deshpande, R. (1992) Relationships between providers and users of market research: the dynamics of trust within and between organizations. *Journal of Marketing Research*, 29(3), 314-28.

Muscio, A., & Vallanti, G. (2014). Perceived obstacles to university–industry collaboration: Results from a qualitative survey of Italian academic departments. *Industry and Innovation*, 21(5), 410-429.

O'Reilly, P., & Cunningham, J. A. (2017). Enablers and barriers to university technology transfer engagements with small-and medium-sized enterprises: perspectives of Principal Investigators. *Small Enterprise Research*, 24(3), 274-289.

Ponomariov, B., Boardman, P.C., (2008). The effect of informal industry contacts on the time university scientists allocate to collaborative research with industry. *Journal of Technology Transfer* 33, 301-313.

Schartinger, D., Rammer, C., Fischer, M. and Froehlich, J. (2002). Knowledge interactions between universities and industry in Austria: sectoral patterns and determinants. *Research Policy*, 31(3), 303-328.

Seppo, M., & Lilles, A. (2012). Indicators measuring university-industry cooperation. *Discussions on Estonian Economic Policy*, 20(1), 204.

Ssebuwufu, J., Ludwick, T. & Béland, M. (2012). Strengthening University-Industry Linkages, In Africa - A Study on Institutional Capacities and Gaps. *Canadian International Development Agency Publication*.

Tartari, V., Breschi, S. (2012). Set them free: Scientists' evaluations of benefits and costs of university– industry research collaboration. *Industrial and Corporate Change*, 21(5), 1117–1147.

Van der Sijde, P. C. (2012). Profiting from knowledge circulation: the gains from university-industry interaction. *Industry and Higher Education*, 26(1), 15-19.