

UNIVERSITY-INDUSTRY COOPERATION: A CASE STUDY OF STUDENT INNOVATION PROJECTS IN LATVIA

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Abstract. The purpose of this study is to identify the most common forms of university-industry cooperation in Latvia, as well as to evaluate the motivating, facilitating, and barrier-creating factors of such cooperation. A case study approach was used to conduct the research, analyzing three projects of the ERDF program “Innovation Grants for Students”, analyzing their documentation, and conducting interviews with the companies involved in the projects as well as project management representatives. The study showed that university-industry cooperation in Latvia is at a stage of development where it is essential to build mutual trust and communication between universities and business.

Keywords: university-industry cooperation, entrepreneurial universities, university-business cooperation, student innovation projects.

JEL Classification: O31, I25.

1. Introduction

University and industry cooperation is a widely discussed topic, especially in the context of university functions such as teaching, research, and knowledge transfer or commercialization (Dan, 2013). Of course, university-industry cooperation is most widely discussed in connection with the third function – the transfer of knowledge created by teaching and research (Laukkanen, 2003; Etzkowitz et al., 2000). However, the implementation of the third function is not always systematic and targeted (Orazbayeva et al., 2019).

Rothaermel et al. (2007) conducted an extensive review of publications in this area, showing the main reasons for and benefits of university-industry cooperation for both universities and businesses. However, the review shows that much of such research looked at university-industry cooperation from university, researcher, and technology transfer perspectives, less so from a business perspective. Several university-industry cooperation studies with a focus on business perspectives investigated the advantages and necessity of such collaboration for large companies (Cassiman & Veugelers, 2002; Czarnitzki & Rammer, 2005), high-tech industries (Hanel &

St-Pierre, 2006), and innovative companies (López et al., 2015; Roigas et al., 2018).

The large-scale study, which was carried out in 2016 and 2017 on the initiative of the European Commission's Directorate-General of Education and Culture at the time, covered responses from more than 17,000 higher education institutions, more than 3,000 company representatives, expert opinions, and case studies. This extensive European-level study on university-industry cooperation clearly showed that, if the “right circumstances” exist, such cooperation has a positive effect on all involved parties. However, the study also allowed us to conclude that there is a “lack of awareness of how HEIs and business can cooperate and how these activities (inter)relate” at the European level (Davey et al., 2018).

These challenges are also mentioned as an important priority in the European Commission's A New European Innovation Agenda, which emphasizes the importance of cooperation between universities and industry in raising the level of research and development (R&D), as well as its role as a “crucial channel for the production, valorisation and diffusion of new knowledge (European Commission, 2022).

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Since 2019, a large-scale program “Innovation Grants for Students” has been implemented in Latvia to promote cooperation between Latvian university students and companies (Labs of Latvia, 2019). Although similar activities have been implemented on a smaller scale previously, university-industry cooperation has not been studied in detail in Latvia. For example, in the already mentioned European-level study on university-industry cooperation, the situation in Latvia reflects only the university perspective (Ejubovic et al., 2019) but not the business perspective.

Therefore, the aim of this study is to identify the most common forms of university-industry cooperation in Latvia, as well as to evaluate the motivating, facilitating, and barrier-creating factors of such cooperation.

The research was conducted using the case study approach, that is, three projects of the “Innovation Grants for Students” program were analysed as case studies for data collection. These projects were “Vidzeme Innovation Program for Students (VIPS)”, “Innovation Grants for Liepaja Students (IGLS)”, and “Innovation Grants for Students in the Interdisciplinary Areas of Art, Culture, Economics, and IT (Make IT)”.

The research question of this study is: What factors motivate, facilitate, and create barriers for Latvian companies to develop cooperation with universities? In this study, an adapted University Industry Innovation Network methodology will be applied (Davey et al., 2018).

The research was conducted by analysing the performance results of these three projects as well as conducting semi-structured interviews with the business representatives that took part in these projects and with the representatives of universities who were responsible for the implementation of the projects. Such an approach made it possible to find out not only the experience of specific projects but also to learn more about the state of cooperation between universities and industry in Latvia, since more than one university was involved in all projects.

The article is structured as follows: in the literature review, the general guidelines of university-industry cooperation, its motivating, facilitating, and barrier-creating factors are examined. After that, a general description of the “Innovation Grants for Students” program is given. The research methodology and selected program projects for case study analysis are presented below. The reflection of the case study’s productive creators and the analysis of the conducted interviews are discussed in the research results section, which is followed by a discussion. Conclusions, directions, and limitations for future research are described at the end of the article.

2. Literature review

The motivation for university-industry cooperation has been widely studied from both the university (researchers, students, and management) and business perspectives. Academic motivation has been analyzed in the

context of entrepreneurial universities (D’Este & Perkmann, 2011), roles in applied research (Franco & Haase, 2015; Beyhan & Rickne, 2015; Ramos-Vielba et al., 2016), and technology transfer (Da Silva & Sartori, 2022; Escobar et al., 2017). Various studies show the different motivations of universities and industry for such cooperation (Freitas & Verspagen, 2009; Seppo & Roolah, 2012; Hurmelinna, 2004).

The study “The State of University-Business Cooperation in Europe” has identified the most important motivators of university-industry cooperation for academics, management of higher education institution (HEI), and business (see Table 1.).

Table 1. Most important motivators of university-industry cooperation for academics, HEI managers and business (source: Davey et al., 2018)

Academics motivators	HEI managers motivators	Business motivators
Get new insights for research	Obtain funding, financial resources	Get access to new technologies and knowledge
Use my research in practice	Improve graduate employability	Improve our innovation capacity
Existence of funding to undertake the cooperation	Use the university’s research in practice	Access new discoveries at the early stage
Address societal challenges and issues	Improve the reputation of the university	Obtain funding / financial resources
Improve graduate employability	Positively impact society	Provide access to better qualified graduates

As shown in Table 1, the motivators for university-industry cooperation among these three groups differ. If for academics they are more related to research, then for HEI management with reputation enhancement. On the other hand, access to new technologies and the development of innovation capacity are more important for businesses. Of course, access to finance is an important motivator for all three groups. Other studies have reached similar results (for example, the Database of research and publications, 2017; Freitas & Verspagen, 2009).

It is different with university-industry cooperation facilitators, some of which are equally important for academics, HEI management, and business, for example, mutual trust, common goals, and available funding (Davey et al., 2018; Rossoni et al., 2023; O’Dwyer et al., 2023; Liu et al., 2019). The most important facilitators of university-industry cooperation are reflected in Table 2.

Table 2 shows very clearly that university-industry cooperation can be facilitated if all involved parties have common interests, goals, mutual trust, and there is available funding for that.

However, the most significant barriers to engaging in collaboration are different for universities and businesses.

Table 2. Most important facilitators of university-industry cooperation for academics, HEI managers and business (source: Davey et al., 2018)

Academics motivators	HEI managers motivators	Business motivators
Existence of mutual trust	Existence of mutual trust	Existence of mutual trust
Existence of shared goals	Existence of shared goals	Existence of shared goals
Existence of funding to undertake the cooperation	Existence of funding to undertake the cooperation	Existence of mutual commitment
Existence of mutual commitment	Existence of mutual commitment	Existence of funding to undertake the cooperation
Interest of business in accessing scientific knowledge	Prior relations with the business partner	Prior relations with the university partner

If for university personnel it is related to a lack of capacity and time, then for business it is related to differences in decision-making and internal processes. A significant barrier is, of course, the lack of funding for cooperation activities (Database of research and publications, 2017; Davey et al., 2018; Rossoni et al., 2023). The most important barriers to university-industry cooperation are reflected in Table 3.

Table 3. Most important barriers to university-industry cooperation for academics, HEI managers and business (source: Davey et al., 2018)

Academics motivators	HEI managers motivators	Business motivators
Limited resources of SMEs	Limited resources of SMEs	Different motivations between universities and our business
Bureaucracy related to the cooperation	Lack of business funding for cooperation	Lack of people with business knowledge within universities
Insufficient time amount allocated by the university for academics for cooperation activities	Lack of government funding for cooperation	Different time horizons between universities and business
Lack of business funding for cooperation	Lack of university funding for cooperation	Lack of government funding for cooperation
Lack of university funding for cooperation	Insufficient time amount allocated by the university for academics for cooperation activities	Bureaucracy related to the cooperation in universities

As can be seen, the most significant barriers arise due to insufficient funding for university-industry cooperation activities and various internal processes.

3. Description of “Innovation grants for students” program

Four support mechanisms (grants) for the development of students’ entrepreneurship were developed in the study “Investigation of alternative models of measures to promote the study process and industry cooperation” commissioned by the Ministry of Education and Science:

- 1) student entrepreneurship catalyst grant,
- 2) grant for the development of students’ innovation abilities based on the work environment,
- 3) grant for student entrepreneurship development centers,
- 4) creating study programs, stimulating the development of students’ entrepreneurship in universities (Database of research and publications, 2017).

At the beginning of 2018, the Implementing Regulation for Activity “Innovation Grants for Students” of Operational Programme “Growth and Employment” was adopted by the Cabinet of Ministers. These regulations provide for the implementation of this activity in two rounds until the end of 2023, with the total planned European Regional Development Fund financing in the amount of EUR 28.9 million and the attracted private co-financing in the amount of at least EUR 9.63 million.

The program provided for the use of funding for the following activities: general costs of the project (management, publicity, etc.), student training in developing entrepreneurship, organizing student motivation and networking events, student scholarships and awards for the best teams, and the implementation of student team ideas (materials, consultations, mobility, etc.). Students’ ideas were divided into two groups: ideas for development based on existing concept evidence (result prototype) and ideas for initial evaluation (result feasibility study) with different available funding. Thus, the actual implementation of the program was quite different from the forms and solutions recommended in the above-mentioned study, for example, regarding the amount of student scholarships, the amount of funding for the implementation of the idea, and the performance indicators of project results.

All projects in the “Innovation Grants for Students” program are listed in Table 4.

As can be seen in Table 4, in the 1st cycle of the program, four projects were implemented involving six universities (some were involved in several projects) with a total budget of over nine million EUR. However, in the 2nd cycle, seven projects were implemented with 16 higher education institutions and a total budget of over 5.7 million EUR. This shows that the results of the 1st cycle contributed to a higher interest of universities (and other partners as well) in this program, but on the other hand, a lower ability to attract private co-financing. This is due to the fact that the 2nd cycle was announced

Table 4. Projects of Innovation Grants for Students program (source: authors' contribution from Ministry of Finance, 2024)

Lead university	Total budget, EUR	No. of partners (No. of universities)
1 st cycle projects		
Latvian Maritime Academy (later Riga Technical University)	835 865	5 (2)
Ventspils University of Applied Sciences	3 318 208	5 (2)
Riga Technical University	2 866 715	5 (2)
University of Latvia	2 241 395	11 (2)
2 nd cycle projects		
Transport and Telecommunication Institute	543 024	2 (1)
Riga Technical University	1 056 496	6 (4)
Latvia University of Life Sciences and Technologies	735 837	3 (1)
Stockholm School of Economics	1 053 094	12 (4)
Vidzeme University of Applied Sciences	717 803	4 (2)
Liepaja University	906 106	5 (1)
EKA University of Applied Sciences	730 701	7 (3)

during the COVID-19 pandemic in 2021, and during its implementation, a war was started in Ukraine.

Considering the total project budget and the number of participating partners, the last three projects from Table 4 were selected for further analysis.

4. Methodology

To answer the research question, the case study approach was applied. Creswell and Poth (2017) define "case study" as a qualitative research approach where the researcher analyzes a one- or more-bounded system (case) over time using detailed, in-depth data collection and various sources of information, such as interviews, observations, and documents, to prepare a case report and case-based themes. Similarly, the term "case study" is also understood in business research (Dul & Hak, 2007).

As previously stated, the successful execution of the "Innovation Grants for Students" initiative required a large contribution from businesses. These contributions took the form of mentorship, problems for students to answer, and most importantly, co-financing. Therefore, it is possible to assess the motivating, facilitating, and barrier-creating factors to university-industry collaboration by analyzing the projects included in such a program.

A case study approach was applied following the procedure described in Creswell and Poth (2017). The specific cases – innovation grant projects – were chosen so that their implementation and results could be compared. Namely, such projects were chosen that were

implemented by universities with a relatively similar number of students, a comparable number and fields of college, bachelor's, and master's-level study programs, and comparable university-industry cooperation to date. The following projects were selected for analysis: "Vidzeme Innovation Program for Students (VIPS)", implemented by the Vidzeme University of Applied Sciences; "Innovation Grants for Liepaja Students (IGLS)", implemented by the Liepaja University; and "Innovation Grants for Students in the Interdisciplinary Areas of Art, Culture, Economics, and IT (MaKE IT)", implemented by the EKA University of Applied Sciences.

For each selected case, an analysis of project documents and publications, an assessment of performance indicators, and semi-structured interviews were carried out both with the representatives of the companies involved in the projects (six interviews in total) and with the management representative of each project (three interviews in total). Two representatives of cooperating companies were selected from each project so that they could reflect both positive and negative experiences.

Interview questions covered such topics as university-industry cooperation forms, motivation, facilitators, barriers, and experience with the "Innovation Grants for Students" projects.

This approach was used to ensure the validity of the results and limit potential bias. Comparable projects were selected for analysis, but for each project, such information was analyzed, which allowed us to evaluate both the positive and negative aspects of its implementation. Thus, triangulation of information sources was ensured (Miles & Huberman, 1994).

All interviews were recorded and transcribed. A thematic analysis of the interviews was applied (Creswell & Pothl, 2017) by coding the transcripts using an inductive approach (Miles & Huberman, 1994). Coding was done digitally using NVivo 14.

The thematic analysis was based on the adapted University Industry Innovation Network methodology (Davey et al., 2018), identifying forms of university-industry cooperation, motivating factors, facilitators, and barriers.

5. Results

5.1. Case study description

All three analyzed cases – projects IGLS, VIPS, and MaKE IT – were projects of the 2nd cycle of the "Innovation Grants for Students" program. This means that their applications were prepared, and they were then implemented according to improved rules, which were adapted based on issues related to the implementation of the 1st cycle projects. However, as already mentioned, the implementation of these projects was affected by the uncertain conditions due to the COVID-19 pandemic, and in the initial stage of their implementation, the war broke out in Ukraine, which only increased the uncertain conditions. However, all projects were fully implemented, and their implementation indicators are summarized in Table 5.

Table 5. Implementation indicators of case studies (source: authors' contribution)

Project	IGLS	VIPS	MaKE IT
Number of participants (students)	152	139	178
Number of teams	104	37	57
Number of participants (companies with funding)	NA	51	34

As can be seen in Table 5, VIPS and MaKE IT projects are more similar; on average, 3–4 students participate in each team, while IGLS is composed of 1–2 students. Although the information about the private funding actually attracted is not yet publicly available (the projects officially ended at the end of 2023), it can be seen that VIPS managed to attract a larger number of companies both as providers of funding and as authors of the challenges to be solved by students. This allows us to assume that Vidzeme University of Applied Sciences (which was the leading partner of the VIPS project), as a regional university, previously had better developed cooperation with regional entrepreneurs than the partners of the MaKE IT project (which mainly represented organizations based in the capital).

Analyzing the information on the project websites, it can be concluded that, despite the well-regulated conditions for project implementation, they were implemented with several significantly different nuances. For example, in the IGLS project, the teams worked with a smaller number of participants, and the so-called “impact internships”, that is, students got to know the operations of companies in a few hours.

5.2. Interview analysis

By coding and thematic analysis of the interview transcripts, forms of university-industry cooperation, its motivators, facilitators, and barriers were identified in the context of the selected case studies. Using the visualization of hierarchy charts, the most common forms of cooperation are reflected in Figure 1, motivators in Figure 2, facilitators in Figure 3, and barriers in Figure 4.

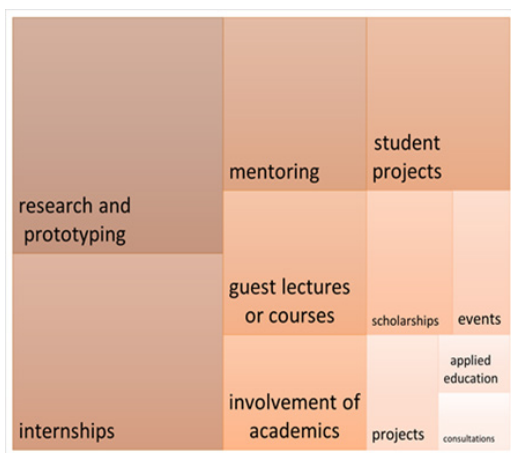


Figure 1. Main university-industry cooperation forms within case studies (source: authors' contribution)

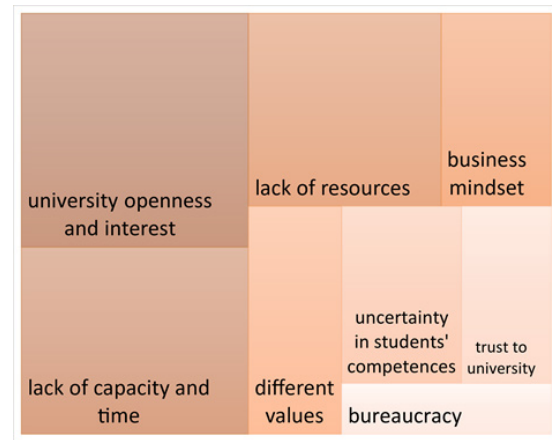


Figure 2. Main university-industry cooperation motivators within case studies (source: authors' contribution)

The most mentioned forms of university-industry cooperation in the interviews were conducting research and developing prototypes on behalf of companies, providing student internships, formulating tasks for student projects, and conducting guest lectures or courses. Mentioning such forms of cooperation is self-evident, taking into account the companies' need for R&D activities, the need for internships (especially in professional study programs), the implementation of the study approach “learning by doing”, and the widespread status of industry professionals as guest lecturers. As one of the entrepreneurs noted, (...) *the university developed a production-ready model for us, and then it was so successful that we can produce our products, which have already been exported to more than 20 countries around the world at the moment.*”

For comparison, also at the European level, conducting joint R&D activities and providing internships are the most common forms of business cooperation with universities (Davey et al., 2018).

It goes without saying that the most frequently emphasized motivators for business cooperation with universities are access to the future workforce and engaging with students. As one of the respondents noted, “*And, of course, when the priorities... apply, we also look at students*”

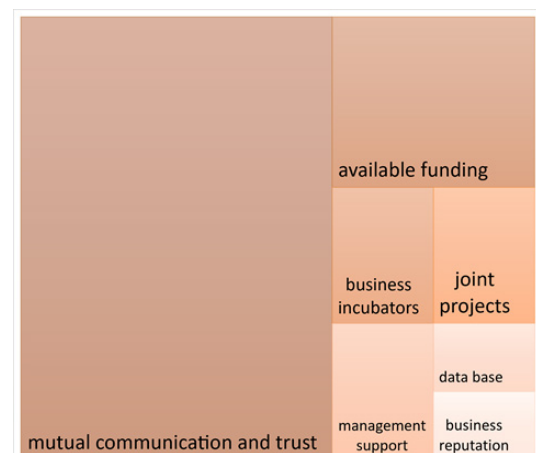


Figure 3. Main university-industry cooperation facilitators within case studies (source: authors' contribution)

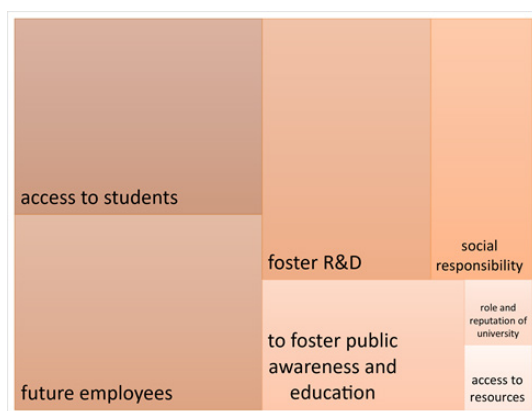


Figure 4. Main university-industry cooperation barriers within case studies (source: authors' contribution)

as our own future employees". Namely, cooperation with students, for example during internships or when students solve company cases, allows this cooperation to be continued already in the form of working relationships. At the European level, the most important motivators for industry to cooperate with universities are others (see Table 1), but access to a better-trained workforce is the fifth most important motivator (Davey et al., 2018).

The most important facilitator for university-industry cooperation is mutual trust and communication. The interviews indicated that trust must be mutual. It is important for universities that companies fulfill their commitments, which, for example, were critical in implementing the projects of the "Innovation Grants for Students" program. At the time of project application, companies signed agreements of intent, including also providing co-financing, but when starting the implementation of the projects, several planned cooperations did not materialize due to unclear circumstances at the beginning of 2022. This is vividly described by the opinion of university management: *"And apparently this honesty in negotiations has also helped to build such a trusting relationship that the company understands, yes, that maybe it can be. So the rules of the game are absolutely clear and transparent, and either the company agrees to these rules or disagrees with them, but step by step"*.

Company representatives also point out that the ability to trust the university is an important factor in promoting cooperation. It can be created over several years by carrying out various activities, and communication with the university is also important. For example, in some interviews, it was indicated that after carrying out cooperation activities, the company did not receive the expected feedback. This is confirmed by the opinion of one of the project managers: *"(..) entrepreneurs are quite pragmatic people, and they either require the other party, i.e., the university, to give an appropriate return or involvement, and not even so much as only as a result, so that the result definitely should come together as they wanted, but more in the process. Well, that there is this communication, feedback with them in the process, that they are involved, that their opinion is requested"*.

In addition, the interviews indicated that the cooperation with the companies in the examined projects was successful because the cooperation organizations involved in the projects, such as regional development agencies and incubators, had such cooperation before the project. What cannot always be said about previous universities' cooperation with industry. It is vividly described by this quote: *"And its forms of cooperation are all based on previous cooperation, some kind of partnership with them. A lot of companies have simply been our members or members of the Green Technology Cluster. And yes, it seems to me that such new, who we tried to appeal to, to attract, well, there were very few of them"*.

In this matter, there is complete agreement with the European level, where "existence of mutual trust" was also mentioned as the most important facilitator (Davey et al., 2018).

The most significant barriers to cooperation between companies and industry can be mentioned as the insufficient openness and interest of universities in such cooperation and the lack of various types of, but especially financial, resources for both companies and universities. The same can be applied to a lack of time and capacity. A good description of such a situation is the opinion of one company: *"We would very much like to expect such activity from universities, with a greater interest in understanding what is happening in companies. In universities, theory is given completely, then this practical side... Yes, and always there is already the question: which side has the greatest initiative and activity, and whose priorities are what?"* The mentioned barriers also exist elsewhere in Europe; however, they are not always the most significant (Davey et al., 2018).

6. Conclusions

This article provided a brief overview of the "Innovation Grants for Students" program and its projects, which were implemented to promote cooperation between universities and industry in Latvia, with a special focus on increasing student entrepreneurship skills. The implementation and analysis of these projects shed light on existing problems in university-industry cooperation in Latvia. It also made it possible to reveal the most important motivators, facilitators, and barriers to such cooperation from both the university and business perspectives.

Although a large part of the most important cooperation motivators, facilitators, and barriers are similar to those elsewhere in Europe, it is necessary to take into account the current stage of the life cycle of university-industry cooperation in Latvia. It also affected the success of the implementation of the "Innovation Grants for Students" program. It is important to note that the more successful implementation of these projects was possible if business support organizations, such as business development agencies or incubators, were responsible for cooperation with industry in the projects rather than the universities themselves.

7. Limitations and further research

The most important limitations for conducting the research were the relatively recent completion date of the analyzed program and its projects (31.12.23), which is why several performance indicators are not publicly available. In the continuation of the research, it is planned to conduct a larger number of interviews, including with companies and university management, as well as a student survey. Such a study has significant practical value, namely in creating similar programs for the next planning period as well as in developing university-industry cooperation in other forms.

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