Abstract

Recently, the issue of cooperation between universities and businesses has emerged in the literature on the subject as a vital issue. One of the most important factors affecting this situation is the changing role of the university. At present, universities are expected to be highly flexible and open to the needs of all stakeholders: students, local government institutions and companies. Cooperation with businesses is extremely important in this context, because it can be implemented in many fields, such as university lectures given by business practitioners, trainings and internships for students, conferences and symposia offered, diploma theses developed in order to satisfy the needs of companies, etc. Joint research projects implemented by entrepreneurs and scientists have become one of the most popular forms of university-business cooperation in recent years. Many of university-business teams aim to commercialize the results of their joint projects.

The aim of the present study is to identify factors determining the cooperation between universities and businesses.

The author sought to offer answers to the question which factors exert the strongest impact upon the success rate of such a form of cooperation. The case study examined the city of Lublin, a city located in East-Central Poland. Lublin stands out in relation to other cities in Poland due to its specific, academic character. Empirical studies were conducted by means of a case study. They commenced with the review of literature and projects executed in the framework of university-business cooperation. Based on the above, a survey questionnaire was developed. It addressed employees of Lublin City Office responsible for mediating the cooperation between universities and business representatives.

The analysis of results enabled the determinants of university-business cooperation to be established. Several practical recommendations were offered. These may facilitate the cooperation in other regions.

Keywords: university-business cooperation, determinants of cooperation, commercialization, joint projects, innovation.

1 INTRODUCTION

In recent years, significant changes in the operation of universities have been observed. Universities have ceased to be venues devoted exclusively to education and research. They are increasingly interacting with the socio-economic environment ([6]). This situation is largely determined by globalization and technological progress. As a consequence, knowledge and competence management gained importance. Students, as participants in the education process, are no longer passive recipients of education but have become partners manifesting specific requirements with regard to the university and education ([5]). Therefore, curricula of studies are modified in order to improve students’ preparation to operate independently on the market upon their graduation. Practical aspects of education, including those delivered jointly with partners representing various businesses are becoming increasingly vital ([17]).

As a consequence, a modern university has become an entrepreneurial and innovative one. It shapes students and faculty members’ entrepreneurial attitudes. The literature of the subject highlights a significant role of universities in stimulating entrepreneurship and its development ([20]). As a consequence, the maintenance of good relations with the socio-economic environment along with the development of responsible relations with internal and external stakeholders has become a critical task of higher education institutions. This requires a multi-faceted perception of universities, including market, stratification and cognitive and educational dimensions ([8]). Universities are expected to become engaged in cooperation at a local, regional and even global level ([19]).
University-business cooperation is currently considered as one of the fundamental priorities of the European Union. Subsequent perspectives of EU funding programs will support projects enhancing such cooperation. The issue has also been recognized by several international bodies, such as the Organization for Economic Co-operation and Development (OECD). The organization advocates its members to intensify the university-business cooperation, which has been reflected in the legislation of individual member states ([4]). Outcomes of such cooperation are beneficial for all involved parties. They improve students and academics’ competences, boost graduates’ employability, offer opportunities for studies in new fields and for practical implementation of research results (commercialization) ([2], [21], [10]).

The literature of the subject, as well as EU programs’ documentation, highlight the need for university-business cooperation, especially in terms of designing and implementing innovations. Effective cooperation between institutions originating from various backgrounds, of different cultures, roles and values, constitutes a significant challenge. However, according to researchers, it constitutes a necessity ([4]). University authorities ought to support the development and intensification of cooperation with businesses and focus upon novelties and innovations ([14]). According to scholars, currently, the flexibility of universities and their ability to adjust to the new model are gaining significance. The new model forces universities to establish a stronger cooperation with businesses, and requires them to be pro-active and innovative.

Experts in the field enumerate several determinants influencing this type of cooperation. The determinants include the following: a change of the model of university operation towards marketing orientation, motivation and leadership, supply of adequate information and tools, prevention of the conflict of interests, time-span of the cooperation, development of effective cooperation, specific character of graduates and means of maintaining contacts with them, support from government institutions ([3], [9], [13]).

The literature features several classifications of university-business cooperation. The division into individual and institutional forms of cooperation (both on the part of the university and businesses) ought to be highlighted. The following can be enumerated ([4], [15]):

- Institutional cooperation, on the part of both universities and businesses, including: cooperation agreements, research consortia, joint research projects, research works commissioned by companies and delivered by universities,
- Institutional cooperation on the part of companies, and individual on the part of universities, i.e. student internships, internships and research conducted by doctoral students, advisory services for enterprises, employment of researchers in enterprises,
- Institutional cooperation on the part of universities, and individual on the part of enterprises, i.e. visiting professors, research internships of employees of enterprises, membership of business representatives in scientific councils of universities, additional employment of employees of companies at universities,
- Individual forms on the part of both actors, e.g. personal contacts, participation in conferences, joint publications, guest lectures, participation in research teams (project teams).

There are several models of university-business cooperation. The following are frequently mentioned 1) cooperation on the initiative of the university and researchers who seek entities interested in financing their research ideas, 2) cooperation initiated by enterprises who finance research in order to implement the results in business practice, 3) tri-lateral model (university-intermediary-enterprise). The intermediary seeks sponsors interested in developing research, and supports joint undertakings ([11]).

2 METHODOLOGY

Empirical studies were conducted by means of a case study method. The method involves a study of selected objects which are highly complex internally and possess complex relations with their surrounding environment. The method makes use of several sources of information (i.e. documents, observations, interviews) ([7], [1]).

The aim of the present study is to identify factors determining the cooperation between universities and businesses. The case study examined the city of Lublin, a city located in East-Central Poland. Lublin stands out in relation to other cities in Poland due to its specific, academic character.

The following research questions were formulated:
1 Which factors determine the initiation of cooperation between Lublin universities and entrepreneurs?

2 Which models and forms of cooperation are pursued in Lublin?

3 What is the role of Lublin City Office in mediating the cooperation between universities and business representatives?

4 Which difficulties were observed regarding the delivery of joint university-business actions?

In order to establish answers to the above questions, the analysis of the literature and documentation was conducted. The analysis also served to formulate research questions and build an interview questionnaire. Subsequently, individual interviews were conducted with three people responsible for such a cooperation, i.e. the Head of Strategy and Entrepreneurship Department of Lublin City Office, as well as the heads of technology transfer centers of two state universities from Lublin:

- Centre for Knowledge and Technology Transfer of the Maria Curie-Sklodowska University;
- Center for Innovation and Technology Transfer of the Lublin University of Technology.

Empirical studies were conducted in 2019 in Lublin. The analysis of results enabled several practical recommendations concerning university-business cooperation to be established.

3 RESULTS

The subject matter of the present study pertains to the determinants of university-business cooperation. The field of study encompassed the city of Lublin, the capital of the region, located in eastern Poland. Up until recently, Lublin has been a city characterized by high unemployment, few investments and low urbanization. However, over the course of the past 8 years, local government authorities invested heavily in the development and enhancement of the city’s economic potential. At present, Lublin ranks among the most swiftly developing cities in Poland. It is also the largest economic and academic center in eastern Poland. The city attracts investors representing high-tech sectors ([18]). Lublin distinguishes itself among other cities in Poland as an academic city with five state universities and colleges and four private ones which offer over 200 various fields of studies in total. Over 20 thousand graduates complete education at these institutions per annum. In the academic year 2017/2018, there were 65 thousand students in Lublin. The number constitutes 20% of the city’s population. As an academic hub, Lublin is also a city with the highest internationalization rate in Poland (in the 2017/2018 academic year, there were approx. 6500 international students from nearly 100 countries) ([16]).

3.1 Determinants of university-business cooperation in Lublin

The analysis of determinants of the cooperation indicated an impact of both external factors and those depending upon the engagement of individuals. Among the external factors, the key significance can be attributed to the opportunity of obtaining external funding regarding the delivery of innovation-related projects, especially those funded by the EU and the National Center for Research and Development. This is especially valid for large contracts which are usually delivered in the form of joint projects realized by entrepreneurs and universities and financed from external sources.

The ecosystems of the city and the region, characterized by considerable openness and pursuit of this type of cooperation constitute another of the external factors. The aspect has been highlighted by the Head of Strategy and Entrepreneurship Department of Lublin City Office. The head believes that the best results are obtained in the framework of recurring and continued work of several competent and engaged people, along with the cooperation being included in the strategy, and these postulates being delivered in practice.

The following internal factors facilitating the establishment and realization of university-business cooperation were highlighted by respondents:

- Prior relations between researchers and representatives of companies, prior experience in cooperation;
- Mutual understanding of the specifics of the partner institution, its organizational culture and institutional requirements (e.g. specifics of the academic year);
• Mutual interest in cooperation emerging from the profile of the operation of the enterprise/researchers’ field of studies;
• Belief of both parties that the cooperation is worthwhile because it may be beneficial (including financial benefits in the form of additional remuneration);
• Activity on the part of technology transfer centers, which were established at universities in order to intensify the cooperation.

According to respondents, the individual characteristics of researchers, especially research team leaders (knowledge, competences, understanding of entrepreneurs’ expectations, interest in cooperation) also determine the establishment of cooperation.

3.2 Models of cooperation

With regard to both the surveyed universities in Lublin, they sign several hundred cooperation agreements with enterprises per annum. Respondents highlighted that the value of these contracts increases year by year. Contracts involving innovative technological solutions present the highest value and amount to as high as 10 million PLN.

Respondents’ answers indicated that all three cooperation models are implemented in Lublin, i.e. cooperation initiated by universities, enterprises, and cooperation mediated by a third party, which also performs as an inhibitor of the relationship.

Respondents’ opinions on the forms of cooperation pursued the most frequently were divided with regard to the number of cooperation forms and specifics of the organization. According to the representatives of the surveyed universities, university-business cooperation is initiated by enterprises the most frequently (in case of approx. 70% of the formalized agreements). If representatives of companies want to realize their ideas but do not possess competences or adequate technologies in the field, they turn to universities (usually by contacting technology transfer centers operating in the structure of the university). Sometimes, when entrepreneurs are interested in obtaining external resources to implement innovations, they are obliged by the regulations of specific calls to establish this type of cooperation. After consulting their expectations with the technology transfer center, they are directed to a specific research team working in the field the investor is interested in. Frequently, the final solution (often significantly) diverges from the initial idea of the entrepreneur. This is a consequence of the fact that when turning to researchers, companies have a merely general concept of the project.

With regard to the remaining 30% of contracts, the cooperation is established on the initiative of universities, their employees in particular. People with research ideas seek sponsors interested in developing or practically implementing the solution created in a laboratory as a research concept.

The situation is much different from the perspective of the city office. Employees of the office usually work within the framework of trilateral projects, where the office assumes the role of a mediator between the university and company. The cooperation is managed on the basis of the Triple Helix model. According to Leydesdorff and Etzkowitz ([12]), the Triple Helix encompasses mutual relations among three types of entities, i.e. universities, enterprises and (self-) governments. This joint cooperation ensures the transfer of knowledge and information and leads to the implementation of innovations as outcomes of the cooperation. In Lublin, the Triple Helix is usually applied to priority sectors for the city and region. This type of cooperation usually translates into direct cooperation between scientists and entrepreneurs. According to the interviewee, the city of Lublin frequently cooperates directly with universities in delivering R&D projects.

3.3 Forms of cooperation

When asked about the forms of cooperation, respondents agreed that a variety of forms, both institutional and individual, are pursued in Lublin. The majority of studies offer student internships. In addition, final theses and doctoral dissertations are frequently commissioned by industry or are based upon prior cooperation. Several entrepreneurs teach classes at universities, are members of university councils. Researchers are often interns in enterprises or offer advisory services. Universities also offer patronage programs, e.g. specific studies educate for a particular employer. Such programs are extremely effective, especially with regard to the high-tech aspect and linguistic proficiency.

However, the most significant types of cooperation pertain to joint R&D projects financed externally (including EU funding) and expert appraisements commissioned by enterprises.
3.4 Barriers of university-science cooperation

Difficulties encountered by respondents regarding joint university-business actions constitute a further issue discussed in the study. Financial difficulties were a barrier voiced universally by all respondents. Sometimes, due to financial reasons, entrepreneurs withdraw from projects or request the delivery timeframe to be modified. Respondents also highlighted hindrances associated with the specific character of the delivered projects, especially with regard to innovation-related projects characterized by considerable unpredictability. This is due to the fact that simulations are not always confirmed in practice, and only sometimes studies are validated by expected results. Respondents also admitted that there were cases where the solution offered by researchers did not meet investors’ expectations. Entrepreneurs sometimes observed that the solutions were science/research focused whereas they expected a more practical approach. This may be due to the fact that researchers seem to work in a different way than the representatives of industries.

Respondents also indicated the state of research at the university as a hindrance. This is due to the fact that universities do not have a closed catalogue of their research offer. Studies/research works are usually delivered on demand.

Shortage of time is also indicated among barriers in university-business cooperation. This results from teaching and academic development obligations. Such gap is usually the reason behind the failure of cooperation, despite both parties’ interest in undertaking joint projects.

4 CONCLUSIONS

The present study concerns the cooperation between universities and businesses, on the example of the city of Lublin.

The analysis of empirical data enabled answers to the research questions to be established. Respondents indicated several factors facilitating the establishment and delivery of effective university-business cooperation. External factors respondents deemed the most significant include opportunities for obtaining external financing for joint projects, and cooperation-friendly ecosystem of the city and region. Internal factors exerting the greatest impact upon the establishment of the cooperation include mutual openness and understanding of different organizational cultures, interest in cooperation in the particular field, and the belief of interested parties in the emergence of mutual benefits resulting from the cooperation.

In conclusion, it ought to be noted that Lublin is a city where business-science cooperation is perceived as a priority beneficial not only to the involved parties but to the city and the region as a whole. As a consequence, the cooperation was included in the city’s development strategy as one of the critical positions in the agenda. University-business cooperation is actively supported by Lublin City Office by its membership and establishment of clusters in the city and region’s priority areas (IT, aviation, medicine, biotechnologies, automotive), development of business ecosystems, direct initiation and realization of university-business cooperation (also with external investors). Particular attention ought to be devoted to five clusters operating in the region. Enterprises, Lublin universities and Lublin City Office perform significant roles in these.

In spite of the difficulties, respondents highlighted that the situation is gradually improving. Cases of university-business cooperation can be observed, and incidental cooperation translates into long-term one. According to the representative of the city office, barriers are gradually overcome, researchers learn to cooperate with enterprises. Further development of the cooperation can be expected in light of changes in SME and R&D financing.

The analysis of the research results enabled the following recommendations for regions interested in enhancing university-business cooperation to be developed:

1. In order for the cooperation to be effective, it ought to be thoroughly thought through, included in the development strategy and subsequently delivered and monitored.

2. Priority areas for the city and region ought to be designated and the cooperation ought to be delivered specifically in these. Such areas should be supported by the development of cooperation ecosystems and clusters.

3. Joint initiatives ought to include city representatives, entrepreneurs, researchers, students and doctoral students.
All forms and types of cooperation are worth pursuing. All actions in this respect ought to be supported.

The engagement of students in the cooperation is valuable. This ought to be realized in the framework of participation in classes taught by practitioners, internships, final theses discussing issues voiced by companies, etc. Such activity develops students’ competences, especially creativity and innovativeness. This may translate into the development of new business initiatives.

REFERENCES


