

MEASURING THE ENTREPRENEURIAL LEVEL OF A UNIVERSITY USING THE HEINNOVATE TOOL – A CASE STUDY

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Purpose: The main purpose of this paper is to assess the entrepreneurial level of a selected higher education institution (HEI) using the HEInnovate questionnaire, which is a tool of the European Commission's Directorate-General for Education and Culture in cooperation with the OECD. The research hypothesis is that the HEInnovate tool can help university executives diagnose the level of entrepreneurship (stagnant level) and design corrective actions to help raise it to a higher level.

Design/methodology/approach: The HEInnovate tool is a European Commission initiative aimed at self-assessment of universities. Its overarching goal is to inspire actions that support innovation and entrepreneurship in European universities in the areas of: education, research, engaging the socio-economic environment, institutional partners and the third sector. This article presents research utilizing this tool at the University of Silesia in Katowice, which served as a case study.

Findings: The use of the HEInnovate self-assessment tool allows higher education institutions (HEIs) to examine their innovative and entrepreneurial potential. It aims to encourage HEIs to reflect on their own practices in order to stimulate an entrepreneurial culture and mindset that inspires people to transform their knowledge into a tangible social values. Today's complex world requires dialogue with representatives of many disciplines. As a result of an analysis of the region's needs and an assessment of the level of entrepreneurship at the University of Silesia in Katowice, measures have been proposed to develop the competencies of academics, non-academics and students in learning and teaching entrepreneurship.

Research limitations/implications: In the process of conducting the research, an opportunity was seen to further improve the tool, which is the HEInnovate questionnaire regarding the implementation of international projects. The results novelty lies in using the HEInnovate tool to examine, analyze, and attempt to predict potential entrepreneurial directions at universities further down the international rankings.

Practical implications: The research team sees an opportunity to use this tool to identify strategic activities related to the development of entrepreneurship and innovation at universities as part of a project to ensure synergies and cooperation of partner universities.

As a result of the survey, it can be concluded that measuring the level of entrepreneurship using the HEInnovate tool can be an important starting point for implementing a new strategy for entrepreneurship development at a higher education institutions. The HEI questionnaire

contains eight areas of different university activities and can serve as a valuable self-assessment tool. With the help of this tool, it is possible to identify the university's strengths and weaknesses in its entrepreneurship teaching strategy as well as any other elements of the assessment, and use the results to base the university's strategy for developing future entrepreneurship and innovation initiatives.

Keywords: case study method; HEInnovate questionnaire; competencies; entrepreneurial university; entrepreneurship; innovation.

Category of the paper: Research paper, Case study.

1. Introduction

In recent decades, rapidly changing socio-economic and technological developments have led to the transformation of universities, whose main role has become to commercialize their research activities to the overall economy and base of knowledge (Borch, Rasmussen, 2010). Modern higher education is attempting to find a balance between the traditionally perceived management hierarchy and an approach that gives autonomy to lower organizational structures encouraging individual innovation and entrepreneurship (Friedman, Silberman, 2003).

The concept of entrepreneurship is a relatively new word. It usually appears in combination with the word: entrepreneur, i.e., a person who manages an enterprise, runs a business on his own account, and with the word preenterprise, meaning "to make a decision to do something, to proceed to implement something" (Polański, 2008). Nowadays, the concept of entrepreneurship is associated with someone who is enterprising, has a lot of initiative and boldly takes and carries out actions (Bańko, 2000). Entrepreneurship can also be expressed as the willingness and ability to undertake various tasks in the fields of industry and commerce: especially in terms of: ingenuity, resourcefulness and operativeness. It also designates forms of social entrepreneurship: distinguishing oneself, showing entrepreneurship, stimulating, urging, encouraging someone to be entrepreneurial (Markowiecki, 2000).

Entrepreneurship is connected with the process of novelty (change), and the basic element that facilitates change is innovation. The concept of innovation (Latin *innovatio* - to renew and *innovare* - to renew) continues to evolve as a result of dynamic social and economic changes in the modern world. Entrepreneurial universities are considered to be those that implement modern teaching methods and technologies that improve digital competencies required in the labor market (Glachant, Haywood, Zorn, 2018), as well as those that make the required flexible changes in administration, organizational culture and the work system (Gjerding, Wilderom, Cameron, Taylor, Scheunert, 2006; Sporn, 1996). A common feature of a modern university is the concept of the university's social responsibility. Hence, the university is no longer treated not only as a center of innovation and knowledge playing an important role in determining the dynamics of growth in national and regional economies and as a source of effects and benefits

for the industry (Acs, Braunerhjelm, Audretsch, Carlsson, 2009; Altmann, Ebersberger, 2013), but also as a key element of social change. Given the dynamically changing labor market, the strategies of modern universities should take into account the impact of its educational programs on the labor market, such as: employability, development of entrepreneurial skills and alignment of graduates' education with employers' requirements (Andrews, Nicoletti, Timiliotis, 2018). In order to better prepare and develop the university's ecosystem for innovation, technology transfer and the entrepreneurship of employees and students, the Silesian University should make a number of changes adapting it to the new challenges facing science and the economy while taking into consideration social needs. Innovation is the visible result of externally invisible processes, and practice confirms that there is a very close connection between the development of organizations and the emergence of innovation (Micieta, Turekova, 2011).

Today, universities are no longer seen only as an element of the triple (Etzkowitz, Leydesdorff, 1999), but also quadruple (Kusio, 2019), or even quintuple helix model (Carayannis, Barth, Campbell, 2012). The purpose of the new set of players: university - economy - government - society - environment is to create a "socio-technical world". However, today's world does not allow action in isolation. In the development of spatial arrangements (local, national and international), European universities are a part of an ecosystem of education, knowledge and information transfer (Kwiek, 2015), the focus of which is now shifting towards fellow European educational and research institutions. Today, the dissemination of information and knowledge at the local level and through local universities and social networks is very relevant and useful (Agrawal, 2006). However, universities are also under increasing pressure to develop international contacts and implement joint European research programs and projects. This will not be possible without the ability of students, researchers, administrative staff and support to implement entrepreneurial activities.

In this paper, the concept of entrepreneurship is considered in connection with innovation and social responsibility, and research sources were subordinated to this definition. The main purpose of this article is to assess the level of entrepreneurial development at the Silesian University in Katowice (UŚ) using HEInnovate, a tool developed by the European Commission's Directorate General for Education and Culture in cooperation with the OECD.

Methodology of this paper presents a case study of the UŚ based on direct (questionnaires among university management) and indirect (review of documentation) research. The research tool used was the HEInnovate questionnaire. In November 2013, they launched www.heinnovate.eu, an online platform with the research tool used the HEInnovate questionnaire. Higher education institutions can use a free self-assessment tool to learn from their peers and develop their organizations. A case study conducted enables the examination of the level of entrepreneurship and innovation in the example of a higher education unit.

The research hypothesis is that HEInnovate can help university executives diagnose and improve the level of entrepreneurship. Entrepreneurship is crucial for individuals, teams, organizations, and legal regulations.

The gap into which the research fits includes the use of a tool for raising the level of entrepreneurship and innovation of the university in terms of the effectiveness of intersectoral cooperation between science and the economic environment - crucial, among other things, for conducting and supporting the implementation of innovative applied research and development work, serving the development of Polish enterprises and the national economy. The study is centered around the achievements of social and humanities fields and benefits the researcher.

The novelty of the results lies in using the HEInnovate tool to study, analyze, and attempt to predict the potential directions of entrepreneurship development at universities further down the international rankings. Using the humanities-systems paradigm to create tools for managing universities will benefit other areas of science and the economy.

The novelty of the results lies in using the HEInnovate tool to study, analyze, and attempt to predict the potential directions of entrepreneurship development at universities further down the international rankings. The use of the humanities-systems paradigm to create tools to support the processes of subjective entrepreneurial management of universities will translate into the development of other areas of science (through the possibility of their adaptation, for example, in the process of training young cadres) and the economy (through the commercialization of the results of the project).

The study conducted by the authors also has a supporting function (Mizerek, 2017). The key question the authors attempt to answer is at what level does UŚ implement the concepts of an entrepreneurial university and whether it does so in accordance with the dimensions proposed in the HEInnovate questionnaire. The study also aims to identify areas in need of corrective processes and to prepare proposals for organizational changes.

The participants in the study are described in more detail at the beginning of section 3. Research methodology.

2. Literature review

Entrepreneurship and innovation

In this paper, the concept of entrepreneurship is considered in relation with innovation and social responsibility (Fig. 1).

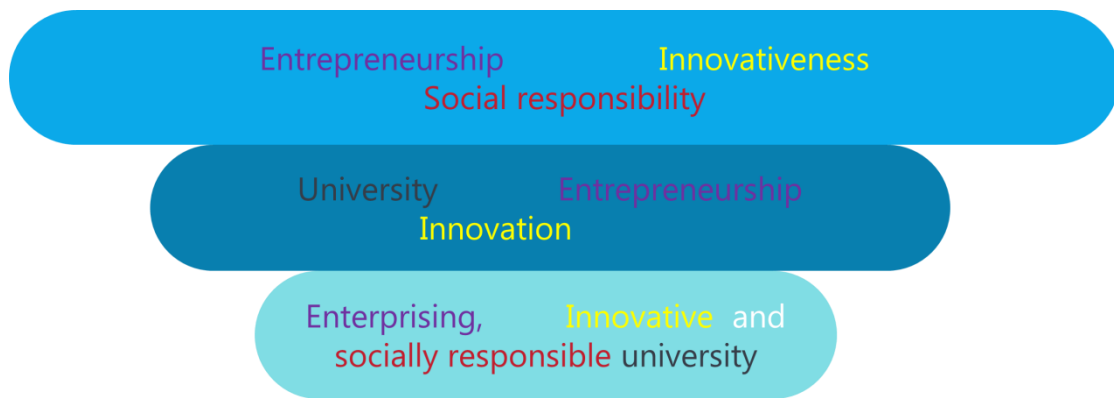


Figure 1. Literature review research scheme.

Source: own study.

The concept of entrepreneurship was coined by the French economist J.B. Say, who recognized entrepreneurship as the fourth factor of production next to such classic factors as work, capital and nature (Dogan, 2015). Schumpeter, on the other hand, defined entrepreneurship according to its innovative features, claiming that economic development is stimulated by innovation in a process called "creative destruction", in which new technologies dynamically replace older ones (Schumpeter, 1994). Kirzner defined entrepreneurship according to its business opportunity potential (Abiyev et al., 2013) as "factories of thought and hope that undertake activities aimed at creating the future in terms of strategic competition and creating value by building resources and skills" (...). Concepts such as flexibility, risk-taking, innovation, creativity, dynamism and development-oriented mindset also appear here (Güney, 2008).

Despite the lack of an unequivocal definition, entrepreneurship can be characterized as:

- the process of creating something new, e.g. a company focused on achieving benefits on the market,
- method of management related to effective management of available resources and appropriate adaptation of the strategy to the prevailing market conditions,
- a set of characteristics of the entrepreneur's conduct, such as willingness to take risks or be flexible,
- innovation, related to the implementation of a novel idea (Augustyńczyk, 2020).

It is widely believed that innovation is one of the most important driving forces of entrepreneurship. Innovation is at the heart of the process of renewing what an organization offers (products and/or services) and how they are generated and delivered (Tidd, Bessant, 2011). R. Rothwell, emphasizing the relationship between knowledge and innovation, defines innovation as a process of know-how accumulation as well as internal and external learning (Szajt, 2008).

Research on the concept of innovation has a relatively short tradition, and the first publications on it began to appear in the 1960s (Romanowski, 2011). The term innovation is understood broadly and refers to all spheres of life, from economic or social life to new thinking

or cultural trends (Janasz, Koziół, 2007). From this perspective, innovation is understood as an interactive learning process that has a social and territorial reference as well as a cultural and institutional context (Vertova, 2006).

It is now accepted that innovation is "the first practical (commercial) introduction (application) of a new product, process, system or device" (Freeman, 1982). It is assumed that it should be a novelty on at least a national scale (OECD (2005). This definition was based on the theory of innovation by J.A. Schumpeter (Schumpeter, 1960). There is a very close connection between the development of an enterprise and the emergence of innovation. Through innovation, the development of an organization can be supported, and its development generally creates the right environment for innovation (Micieta, Turekova, 2011). Most often, three main types of innovation are distinguished: product (new products), process (new production processes) and service (new services) (Tidd, Bessant, 2011). Under market conditions, a broader division of innovation is used:

- product, consisting in the production of a new or modernized products,
- processes, improving manufacturing methods and technologies,
- technology, introducing changes and improvements in the processes, products and systems used,
- marketing, introducing changes to the company's market policy and business model,
- organizational changes, involving changes in the internal and external relations of enterprises (OECD, 2005).

The above various innovations possess the following characteristics:

- complementary, extending or supplementing the range of possibilities for change and improvement in technological and organizational processes,
- radical, resulting from scientific research, creating completely new goods, products or services on the market,
- social, i.e. innovative organizational solutions meeting a wide range of societal needs (Janasz, 2002).

The basis of every innovation is new knowledge. The ability to innovate depends not only on the ability to create new knowledge, but also to transfer it (share it), as well as to absorb it and use it in practice (Jasiński, 2021).

The OECD – Organization for Economic Cooperation and Development, which includes 30 highly developed countries, has made the greatest contribution to innovation research methodology. More than forty years of experience in the development of indicators useful for international comparisons and assessment of individual countries has resulted in a series of methodological manuals called the Frascati Manual. The series includes manuals on: R&D research methodology (Frascati Manual); innovation research methodology (Oslo Manual); innovation in developing countries (Bogota Manual); scientific and technical staff (Canberra

Manual); technical balance of payments (TBP Manual); patent statistics (Patent Manual) (Toczyńska, 2015).

Today, we distinguish three basic models of university operations, which represent their way of functioning on the market and in society. First generation universities are based on the development of science. Second generation universities are based on activities related to the development of science and the implementation of scientific research. On the other hand, the third generation university, apart from science and research, also engages in the commercialization and transfer of knowledge from the university to the socio-economic market (Makiela, 2017). Concepts such as an entrepreneurial university, academic (university) innovation and the concept of university social responsibility are related to how universities function.

3. Entrepreneurial University

The concept of an entrepreneurial university is associated with the concept of the knowledge production mode (Gibbons et al., 1994). Although they did not directly use the term "entrepreneurial university", they indirectly identified the university as the main place for creating new scientific and technical knowledge in highly industrialized countries. This concept was the basis for the emergence of the idea of an entrepreneurial university. The term "entrepreneurial university" was first used by B. Clark in 1998 (Clark, 1998). He pointed to the problem of diversification of sources of financing. According to Clark, a wide range of commercialization of research results and intensive cooperation between the university and the business sector are the two interrelated and essential features of an entrepreneurial University which constitute a significant sources of revenue (Jasiński, 2021). The concept of an "entrepreneurial university" was popularized by H. Etzkowitz who based his concept on the following four pillars:

- academic leadership capable of formulating and implementing strategies,
- supervision over the correct use of university resources,
- ability of the university to transfer technology/knowledge, produce patents and create business incubators,
- ethos of entrepreneurship in the academic environment (Etzkowitz, 2002).

An entrepreneurial university is a modern, multi-dimensional institution, operating in many areas, looking for new opportunities and actively co-creating its future. It is primarily characterized by flexibility in adapting to the changing conditions of the education and research market (Pluta-Olearnik, 2009). In Poland, the concept of an entrepreneurial university appeared in 2002. Four models of coordination of the higher education system and academic research have been identified, including a model of market coordination. It assumes the independence

of researchers and universities in relation to the overall market conditions. For the provision of external education and research services, they receive funds and/or other resources for their activities (Jabłeczka, 2002). It was the market model that served to crystalize the concept of an entrepreneurial university as the recommended model of the 21st century university.

A state university is both a public institution and a unit of the state budget. Hence, attention should be paid not only to the "classic" entrepreneurship (external, directed to the environment), but also to the role of intrapreneurship (Jasiński, 2021). Polish universities have just completed the first stage of the transformation consisting in an increase in the number of students. The second stage is in progress - improving the use and efficiency of public financing received, and the third stage - partnerships with the business sector - is still ahead of it (Leja, 2013).

4. Academic innovation

Reflections on the ongoing changes of the university as higher education institution cover many levels. These include the effects of universal access to higher education, low level of knowledge of secondary school graduates, differentiated level of education in higher education institutions, as well as ensuring high quality education, adapting educational programs to the labor market, shortages in financing scientific research, limiting non-compliance in the process of academic advancement, etc. The deteriorating assessment of higher education institutions by the public is also a source of concern. This is caused, among others, by improper supervision over the functioning of some public and private universities and non-compliance with formal and legal procedures (Wawak, 2017).

An element of the discussion on the functioning of a university is how to better use the greatest value of the university, which is its employees, students, graduates and the knowledge they possess. Under the influence of the challenges of the modern world and the knowledge-based economy, there is a conviction about the need to create an entrepreneurial/innovative university (Andrzejczak, 2015).

In the process of managing an innovative university, the rector and the senate are of decisive importance. It should take into account the principles that strengthen the activity and flexibility of organizational units. The leading principles, the application of which is a condition for managing an innovative university, include the following:

- redundancy or excess, indicating that an excess of unnecessary or harmful regulation of the work of teams (e.g. research teams, individual employees) leads to unintentional consumption of resources, without the possibility of obtaining rational effects,
- interdisciplinarity, based on: "breaking down the boundaries between disciplines, not on summing up knowledge",

- flexibility, enabling management to introduce solutions deepening the university integration process by means of statutory and institutional instruments that do not necessarily cover all teams/employees. Flexibility can be provided through procedures for mechanisms to deal with different scenarios,
- self-organization, which says that managers should be flexible and should facilitate self-organization of teams, not organizing them,
- self-regulation enabling the use of explicit and tacit knowledge to achieve the assumed goals of the organization, research teams, and university employees,
- self-control that allows you to build positive relationships in the team, tolerance, openness and substantive discussion (Leja, 2011).

Taking into account the state of research as of date, the specificity of innovative activity in service organizations, including educational organizations, it is possible to define the features that an innovative university should have. These are as follows:

- competitiveness. This means that the university has the ability to create its own integrated diploma programs, is capable of providing educational services for which there is a demand and there is a demand for its services, is equipped with modern equipment and highly qualified research and teaching staff, cooperates with the broadly understood economic and social environment, and has a strong brand against the background of competition,
- leader on the market of educational services. This can be seen by its active role and significant position in the educational space of the city/commune, country, systemic relations and cooperation with external partners, including abroad,
- secure environment i.e. safe, ergonomic, with full infrastructure in the field of health, sports, food, cultural facilities, information services, IT, psychological support and material assistance. It has Social Activity Centres, and or which are is open to the participation of scientific, professional and social organizations,
- carries out innovative activities, i.e. conducts research, implements projects, publishes research results and transfers knowledge into market practice in cooperation with business partners, participates in public-private partnerships, and integrates into the European research area,
- develops and implements innovative education technologies, new, flexible study programs in standard and extended modes, including the summer semester. It takes into account mobility in the organization of studies, popularizes the three-stage study system, introduces new methodologies and active teaching methods such as the project method, e-learning, blended learning, case working, case study, and others. At the same time, an innovational university is not only an educating entity but is also a learning organization. It creates and transfers knowledge, shapes skills and qualifications, disseminates its own experience and implements best practices of other universities,

- implements organizational and marketing innovations in university management processes, internal and external communications. It creates infrastructure and new technology to support and develop all participants of the educational and research process, develops new strategies, methods and tools in the field of promotion, distribution and pricing policy, offers additional benefits for participants of the education process and implements flexible systems of their adaptation within the university, and has beneficial affects on professional and private activities of students and staff,
- it is creative, where work at the university is a passion for the employees and inspires students and listeners alike. Innovation starts with creative ideas, which over time translate into inventions, products, services, processes and methods. There is no innovation without creativity. The latter is about making connections. Innovation cannot happen if actors lack passion. Innovational success is determined by the following conditions: the scope of using new ideas, feasibility, market justification, focused on student and markets, and an environment and organizational solutions conducive to innovation (Toczyńska, 2015).

It should also be emphasized that the system of measuring innovation in industry, recommended by the OECD and used for years, completely fails in the service sector. Therefore, various university innovation rankings based on indicators such as:

- the number of patents, protection rights and licenses filed,
- the value of EU funds obtained,
- innovative facilities in the form of the Knowledge and Technology Transfer Center (or similar) can be described as insufficient.

The specificity of services results from their nature, and they are defined by: immateriality, non-uniformity, impermanence, simultaneous process of providing and consumption. Knowledge-based services, such as education and university services, are particularly unique (Toczyńska, 2015).

5. The concept of social responsibility of the university

The multiplicity of roles played by universities makes it difficult to formulate a single, coherent answer regarding its responsibilities, even when limited to just "social responsibility". These roles include:

- direct easement (meeting the needs of students, staff or the social neighborhood of the university),
- cognitive functions - multiplication of knowledge, not necessarily directly useful,

- education in view of not only the labor market,
- preparing graduates to fulfill the role of social leaders,
- preparing graduates to propagate civic culture and good habits.

Attempting to summarize these various functions with one term, we think of the academic ethos, understood as a set of values to which the life of a university in all its dimensions is subordinated and adopted as an axiological justification for attitudes and actions. A responsible university, therefore, can be said to be a university that cultivates the desired values of the academic ethos and acts in accordance with its values (Chmielnicka, 2008).

The university carries out activities in three areas:

- market provision of educational services,
- provision of public (moral) goods,
- provision of knowledge (Sulejewicz, 2003).

It can therefore be said that in the first sphere, a university is a kind of business organization which, after developing certain knowledge/technology, produces educational services for a strictly defined market segments. In the second sphere, it is seen as an educational institution reproducing, among others, the political functioning of the state and civil society (national interest, social service), which, through techniques of raising generations, creates a coherence of value systems, culture, and shapes civic attitudes. In the third sphere, namely the sphere of knowledge, the university implements the values and methodological postulates within the sociologically defined conditions of the existing paradigm, i.e. the general conceptual framework. This existing paradigm, by its very nature, generates classical science, i.e. the process of solving puzzles constantly undertaken by scientists (Sulejewicz, 2008).

Universities, while conducting teaching and research activities, bear social responsibility, which is more and more clearly perceived, both in the academic environment and in the broadly understood overall environment. This concerns both the preparation of graduates to perform the roles of knowledge workers in the knowledge-based economy, as well as the creation of close relationships with the business community and local government. This also applies to the need to improve the efficiency of spending public funds allocated to the operation of universities. So what is the social responsibility of the university? How to achieve a symbiotic relationship between the university and the overall environment? What can be the activities "from the university to the environment" and what are those directed "from the environment to the university". These are the basic questions that K. Leja tries to answer (Leja, 2008).

Judith Sutz sees the transformation of universities, which, in addition to two traditional roles, i.e.:

- educating students,
- conducting scientific research (Sutz, 1997)

universities play a third and increasingly important role, namely creating mutual relations with the overall environment.

Bogdan Wawrzyniak puts forward the thesis that the university of the future is one that is looking for a system of values different from the current one (i.e. based on global competition), namely a system built around social responsibility. In order to become an organization that serves the overall environment, such a university must positively, but not uncritically, respond to the expectations of stakeholders, and the degree to which these expectations are met is a measure of its social responsibility (Wawrzyniak, 1999). Understanding the importance of the university's social responsibility depends on the good will of the management and the employees' conviction of the importance of the problem. This certainly requires a broad debate among the academic community. The suggested changes require the adoption of the axiom for the need to implement knowledge management processes in universities, so that these organizations can become the leaders in the journey of knowledge, setting its direction and dictating the pace (Leja, 2008).

The most courageous method of shaping the future of the university would be to use the model created by Russell Ackoff (Ackoff, Magidson, Addison, 2007). The starting point of this method is the diagnosis of the current state of the university and the determination of the shortest possible way to reach the ideal. However, in both Polish and European academic institutions, the conditions are so complex that it would be difficult to use the method used in American commercial and non-commercial enterprises.

6. Research methodology

The research was conducted in the form of a case study. The methodology proposed by W. Czakon (2006) was used, which consists of the following stages: defining research questions, selection of cases, selection of data collection tools, data collection, data analysis, shaping generalizations, checking research results with literature and formulation of generalizations.

The University of Silesia in Katowice was selected for the case study. The university consists of 4 campuses (Katowice, Sosnowiec, Cieszyn, Chorzów), containing 8 faculties (Faculties of Humanities, Natural Sciences, Social Sciences, Exact and Technical Sciences, Law and Administration, Arts and Educational Sciences, Theology and the Film School) and 2 doctoral schools (Doctoral School at the UŚ and the International Environmental Doctoral School at the Center for Polar Studies). It offers 25 scholarly disciplines in 84 fields of study and 218 specialties. The university operates 17 research centers and over 200 laboratories, has over 600 research teams and organizes about 60 scientific conferences each year. It grants undergraduate, graduate and doctoral degrees. Thus, it plays an extremely important role in the transformation of the region - from an industrial past to an innovative future. In addition, since 2022, the UŚ, together with 7 European institutions, has been implementing the „Entrepreneur

- Entrepreneurial Preparation for Notable and Engaging Universities” project. It is a project supporting European universities in becoming more entrepreneurial and innovative. By fostering the competencies of the future, it will provide a new generation of student-entrepreneurs and innovators. It will bring about a radical change by creating student-centred, non-elitist, open and inclusive universities based on cooperation between higher education institutions, the public and private sectors and citizens.

The key research tool used to collect information and determine the level of implementation of the entrepreneurial university concept was the **HEInnovate** questionnaire. The results of direct research (interviews, participant observations) and indirect research (review of EU and national documentation) were used. The authors chose the research sample deliberately. For the study, on behalf of the Rector of the University of Silesia - prof. dr hab. Tomasz Pietrzykowski (Vice-Rector for International and Domestic Cooperation of the University of Silesia in Katowice - the management staff of the university was invited to participate. Among the 16 evaluating judges there were, among others, persons performing the functions of deans (31%), directors (25%), department heads (37.5%) and personnel performing other functions who did not indicate their specific position (6.5%). In the second stage, the team of researchers conducted training for all those willing to participate in the study. The training was conducted on 8.12.2021 and its aim was to familiarize all interested parties with the tool and answer all questions about its functioning. The third stage consisted in collecting answers. The HEInnovate questionnaire was completed by respondents on the HEInnovate platform (<https://heinnovate.eu/en>). The author participated in the training as expert support for respondents.

Participants of the study were asked to indicate to what extent the University of Silesia applies the proposed model solutions (on a scale of 1.0 to 5.0). The next step in the research procedure was analysis of the collected data, consisting in organizing the collected material, and then its hierarchization in accordance with the rating assigned to individual dimensions. The results of the study allowed the development of a preliminary diagnosis of the University of Silesia in Katowice in relation to the concept of an entrepreneurial university and the university's social responsibility. Strengths and weaknesses, opportunities and threats for the university in the context of entrepreneurship development, key conclusions and recommendations were indicated.

The **HEInnovate** tool is an initiative of the European Commission aimed at self-assessment of higher education institutions. Its primary goal is to inspire activities supporting innovation and entrepreneurship of European universities in the areas of: education, research, engaging the socio-economic environment, institutional partners and the third sector. The use of the HEInnovate self-assessment tool allows higher education institutions (HEIs) to examine their innovation and entrepreneurial potential. It aims to encourage universities to reflect on their own practices in order to foster an entrepreneurial culture and mindset that inspires people to transform their knowledge into tangible social value. The interactive form is available in various

languages, including Polish. It evaluates eight areas of the university's activity, in which the respondent determines how much he agrees or disagrees with a given statement in accordance with his experience, knowledge or intuition. These areas are:

- **Leadership and Administration** - This section lists some of the most important factors that a HEI can consider to enhance its entrepreneurial action plan, such as: institutional strategy, implementation of the action plan, model for coordinating and integrating entrepreneurial activities across the institution, incentives for faculties and units, and the driving force for entrepreneurship and innovation in regional, social and community development;
- **Organizational capacity** - funding, people and incentives – this addresses key resources such as funding and investment, people, expertise and skills, and incentive systems that are needed to sustain and develop the institution's entrepreneurial capacity. The factors examined are: Objectives supported by a wide range of sustainable financial and investment resources, Capabilities and culture for building new contacts and synergies across the institution, Openness to engaging and hiring people whose approach, behavior and experience are related to entrepreneurship, Investing in developing employees, and incentives and rewards for employees;
- **Measuring the impact of change** - Entrepreneurial/innovative HEIs need to understand the impact of the applied changes within their structures. This section identifies areas where an institution can measure the impact of change: regularly assessing the impact of its entrepreneurship action plan, how much staff and resources support its action plan, assessing entrepreneurship teaching and learning across its structure, assessing the impact of support for start-up businesses, assessment of knowledge exchange and cooperation, and assessment of international activities in relation to the entrepreneurial roadmap;
- **Entrepreneurship teaching and learning** - involves the search for innovative teaching methods and ways to stimulate entrepreneurial thinking. This section measures whether the institution provides a variety of formal and informal learning opportunities, validates entrepreneurial learning outcomes, develops and delivers a curriculum together with external stakeholders, and integrates research into entrepreneurship education;
- **Internationalized institution** - Internationalization is the process of integrating an international or global dimension into the design and delivery of education, research and knowledge exchange. It is measured whether internationalization is an integral part of the higher education institution's entrepreneurial agenda, whether it openly supports the international mobility of its staff and students, whether it seeks out and attracts international staff from the business community, whether the institution's approach reflects international perspectives, and whether its approach to research reflects international standards;

- **Preparing and supporting entrepreneurs** - A higher education institution can help students, graduates and staff consider starting an enterprise as a career development step. It examines whether the Higher Education Institution raises awareness of the value of entrepreneurship and stimulates entrepreneurial intentions, supports the transition from concept to enterprise creation, offers training to help them start, run and grow their businesses, whether experienced people from academia or industry offer mentoring and other forms of personal development, whether the institution facilitates access to finance for its entrepreneurs and whether it offers or facilitates access to business incubation;
- **Knowledge exchange and cooperation** - is an important catalyst for organizational innovation, progress in teaching and research, and regional development. It is an ongoing process that encompasses the 'third mission' of higher education institutions, defined as the stimulation and direct application and exploitation of knowledge for the social, cultural and economic development of society. It is examined by assessing whether the institution undertakes to cooperate and exchange knowledge with industry, the public sector and society, whether it shows active involvement in partnerships and relations with various stakeholders, whether there are strong ties between the university and incubators, science parks and other external initiatives, whether it enables staff and students to participate in innovative activities involving enterprises/external environment and whether it combines research, education and industry (wider community) activities to exploit new knowledge;
- **Digital transformation and potential** - the self-assessment section contains a number of statements describing the digital potential of higher education institutions, defined as the ability to integrate, optimize and transform digital technologies to support innovation and entrepreneurship. It examines whether the institution develops digital culture and implements and monitors a digital strategy to support innovation and entrepreneurship, whether it invests, manages and constantly modernizes specialized digital infrastructure, whether it supports the use of digital technologies to increase the quality and equality in teaching, education and assessment, whether it uses open educational resources, open science and open methods of data processing to increase the institution's effectiveness and increase its impact on the existing ecosystem, and whether it makes full use of its digital resources to promote innovation and entrepreneurship in a sustainable and inclusive way.

In addition to the score from 1-5, it is possible to select the N/A option (not applicable). Each respondent can evaluate any number of areas/ranges. Link to the tool's website: <https://heinnovate.eu/en>.

The choice of the tool was dictated by several considerations. First of all, the desire to test the research model in relation to a specific university, the desire to better understand the factors that affect the current condition of the university and its level of entrepreneurship and

innovation, and the possibility of modifying and filling cognitive gaps and refining the theory (Ćwiklicki, Pilch, 2018). The study conducted by the authors has an auxiliary function - this form of research was chosen to illustrate an issue important to researchers (Mizerek, 2017). The key question the authors tried to answer was: at what level does the University of Silesia implement the concepts of an entrepreneurial university and whether it implements it in accordance with the dimensions proposed in the HEInnvention questionnaire. An additional aim of the study was to identify areas requiring correction and/or improvement and to prepare proposals for changes for the organization. The study was deliberately limited to the University of Silesia, as it participates in the "Entrepreneur" project (an obligatory activity under this project was to carry out a study using the HEInnovate questionnaire). This increased the chances of: 1) using practical knowledge and experience in the study, 2) wider access to documents, 3) broadening the group of management staff in the study. The preparation of the theoretical layer of the study consisted in studying secondary sources published in national and foreign scientific journals: previous research and analyses, in particular data obtained from the research carried out earlier by the Czaja, Kafel et.al from the Krakow University of Economics (Czaja, Kafel, 2020), EU and Polish state documents and articles related to the concept of entrepreneurial universities such as social responsibility and innovation. In the first stage of research, through direct interviews with the management of the University of Silesia, a group of respondents was identified. They were then selected from key university staff responsible for the quality of education and the development of entrepreneurship: (Industry Cooperation Office, Office for International Cooperation, Faculty of Life Sciences, Faculty of Science and Technology, Faculty of Humanities, Faculty of Social Sciences, Institute of Art Sciences, University Press Śląskie, Department of Education).

7. Research Results

The HEInnovate self-assessment tool was a mandatory step in the application process by the University of Silesia to the **Inicjatywy EIT HEI Initiative** "Innovation Capacity Building for Higher Education", which is a joint action of the EIT Community. This initiative is a key objective of the European Institute of Innovation and Technology (EIT) as part of its new strategy, the EIT Strategic Innovation Agenda 2021-2027. The initiative aims to support higher education institutions through expertise and coaching, access to the EIT innovation ecosystem and funding, enabling them to develop innovation roadmaps that complement the needs of participating individual higher education institutions.

All pilot projects selected for funding under the HEI Initiative were required to create an Innovation Vision Action Plan (IVAP) as part of their application. The IVAP should present a long-term vision to increase the innovative and entrepreneurial capacity of the relevant HEIs at the institutional level. The IVAP was developed on the basis of HEInnovate's self-assessment for the University of Silesia in Katowice, in order to guide the selection of activities proposed for funding and potential institutional changes at the university (<https://heinnovate.eu/en>).

The results of the survey on the implementation of the entrepreneurial university concept at the UŚ seems unsatisfactory. The results are as follows:

- Leadership and governance – 3.0.
- Organisational capacity: funding, people and incentives – 2.8.
- Measuring impact – 2.2.
- Entrepreneurial teaching and learning – 2.8.
- The internationalised institution – 3.3.
- Preparing and supporting entrepreneurs – 2.2.
- Knowledge exchange and collaboration – 3.1.
- Digital transformation and capability – 2.2.

The results are shown in Figure 2. The final scores ranged from 2.2 when measuring impact, 2.2 when measuring preparation and support of entrepreneurs to 3.3 when measuring the internationalization of institutions. In this survey, from among eight dimensions studied, one dimension was singled out for detailed analysis, namely: **Entrepreneurship teaching and learning**. This choice was dictated by the fact that the UŚ is in the process of implementing a new strategy to improve the programs for undergraduate and graduate degrees entitled: "A new concept of studies at the University of Silesia in Katowice". The intention of the research team was to propose solutions to strengthen the entrepreneurship component of the new curriculum. As the Rector of the UŚ stated, a new concept of university studies is needed to address the changes in the cultural paradigm, demographic reality, new technological opportunities for students and the need to instill in students the joy of creating and innovating. According to the definition proposed by the authors of the **HEInnovate** tool, Entrepreneurship teaching and learning should be understood as a search for innovative teaching methods and ways to stimulate entrepreneurial thinking. It is not only about learning entrepreneurship, but also about gaining entrepreneurial experience and acquiring skills and competences to develop entrepreneurial thinking.

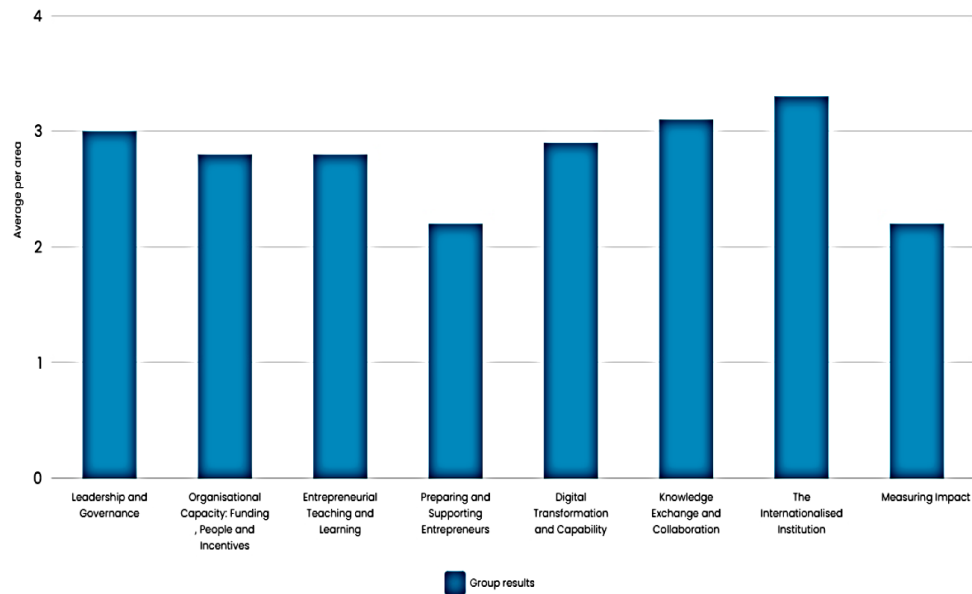


Figure 2. The result of the study of the level of entrepreneurship with the HEInnovate tool for the University of Silesia in Katowice.

Source: own study.

The HEInnovate tool then indicated an assessment of the five elements that make up the area: **ENTREPRENEURIAL TEACHING AND LEARNING** (Figure 3):

- The university provides various opportunities for formal education in order to develop entrepreneurial attitudes and skills. (-3.1).
- The university provides a variety of informal learning opportunities and experiences that stimulate the development of entrepreneurial attitudes and skills. (-2.9).
- The university validates the learning outcomes of entrepreneurship, which drives the design and implementation of the entrepreneurship curriculum. (-2.4).
- The university co-creates and delivers the curriculum with external stakeholders. (-2.7).
- Entrepreneurship research results are integrated with the educational offer in the field of entrepreneurship (2.7).

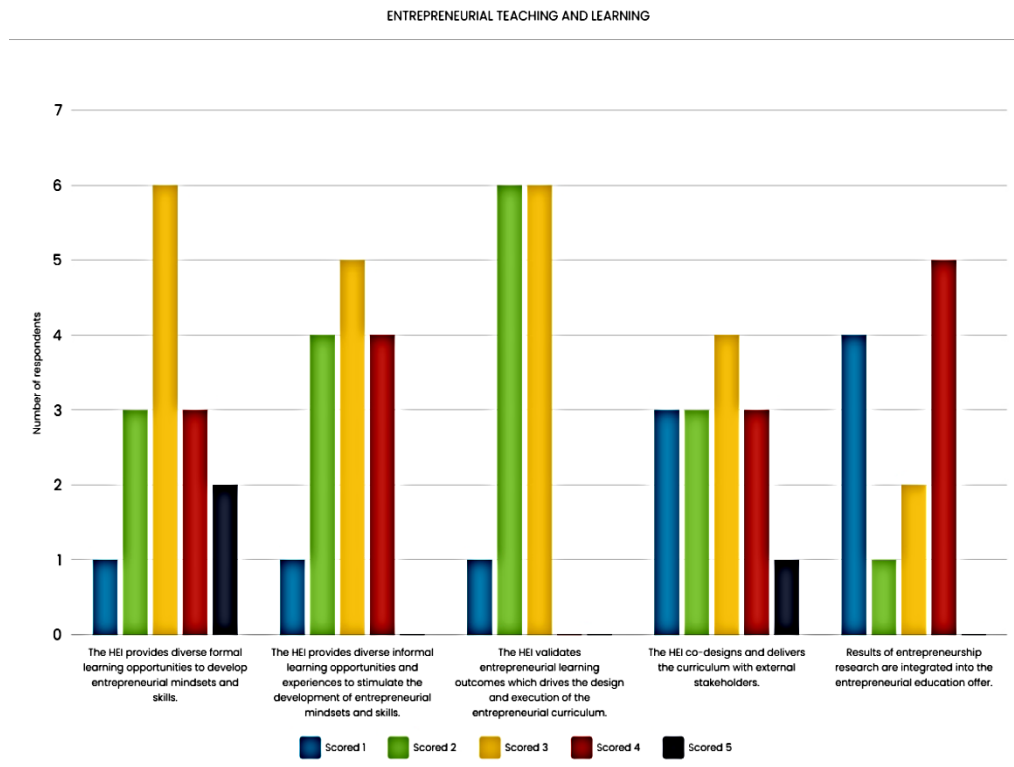


Figure 3. The result of the study of the area entitled: "ENTREPRENEURIAL TEACHING AND LEARNING" with the HEInnovate tool for the University of Silesia in Katowice.

Source: own study.

The highest score (score of 3.1) was given to the first area: "The higher education institution provides a variety of formal learning opportunities to develop entrepreneurial thinking and skills." By this it is meant that an entrepreneurial higher education institution provides a range of opportunities to facilitate innovative teaching and learning across all faculties. Such a higher education institution should foster innovation and diversity in the approach to teaching and learning in all departments, as well as the development of an entrepreneurial mindset and skills for all programmes. To earn a high score, a higher education institution might, for example:

- support changes in curriculum to stimulate and develop entrepreneurial thinking and skills through new teaching methods and student-centred, interdisciplinary and practice-based learning (e.g. living labs, use of case studies, games and simulations),
- support employees in developing a new entrepreneurship curriculum,
- provide students with ways to evaluate and provide feedback on the course,
- introduce new mechanisms to support students, including those that enable them to gain experience in setting up new ventures as part of a formal education or providing entrepreneurship education with active entrepreneurs.

The area related to the assessment and evaluation of learning outcomes received the lowest score: "The higher education institution validates the entrepreneurial learning outcomes that drive the planning and implementation of the entrepreneurship curriculum" (rating 2.4). In this area, attention is paid to the development of important skills and competences.

They are necessary both for graduates who run enterprises and for entrepreneurial graduates who enter the the workforce. A higher education institution that places a high value on entrepreneurial learning commits to regularly reviewing, recognizing and updating course content and learning outcomes for all study programmes. To earn a high score, a higher education institution might, for example:

- codify the expected outcomes of entrepreneurship learning in terms of knowledge, skills and competences for all study programmes,
- ensure that students can fully understand the expected and achieved outcomes of entrepreneurship learning,
- validate entrepreneurship learning outcomes at institutional level,
- recognize entrepreneurial learning outcomes by including them in student achievement records.

As shown in Figure 4, the persons who assessed the indicated area are:

- deans,
- professors,
- employees of technology transfer offices (in the case of the University of Silesia, it is the Industry Cooperation Office),
- others (personel performing other tasks).

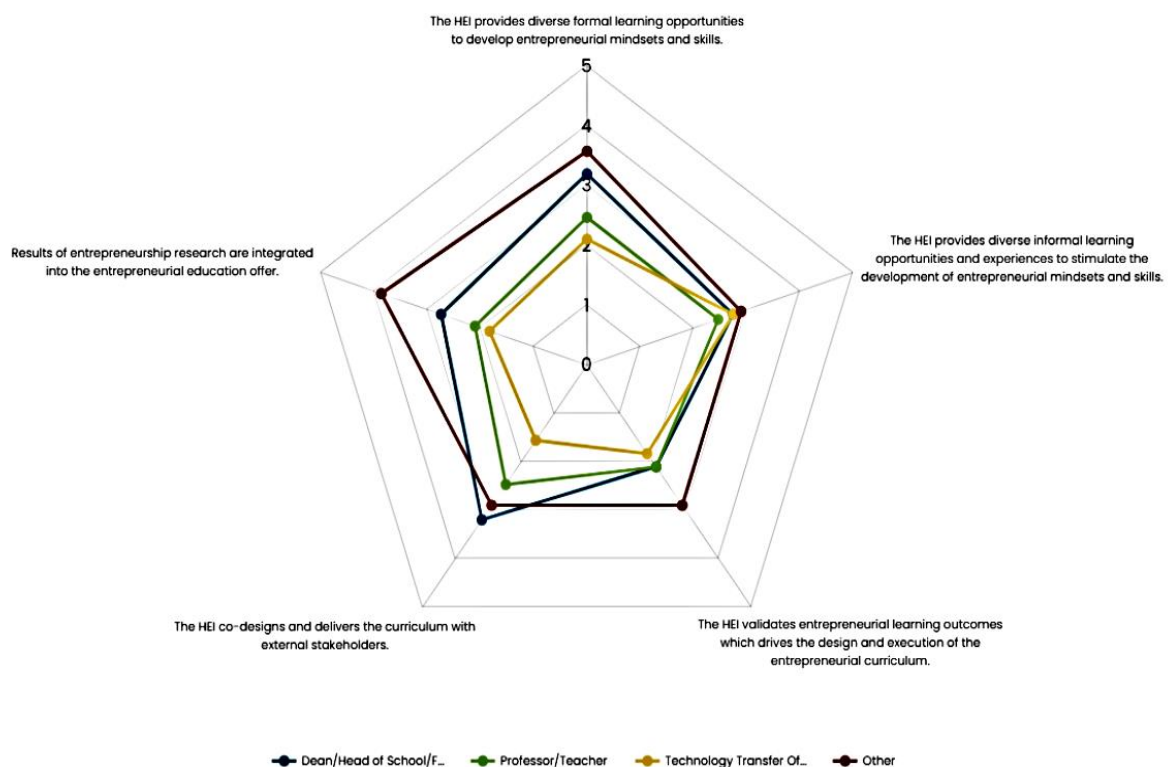


Figure 4. The result of the study of the area entitled: "ENTREPRENEURIAL TEACHING AND LEARNING" with the HEInnovate tool for the University of Silesia in Katowice with an indication of the job position of the examined person.

Source: own study.

These results indicate that the surveyed institution implements activities for teaching and learning entrepreneurship, albeit to a moderate or low degree, but it is not a permanent process and long-term results and effects are not examined. In addition, deans and professors holding managerial positions participating in the study strongly indicated the lack of validation and evaluation of the results related to teaching entrepreneurship. This result strongly corresponds to the weakest area obtained by the university in terms of impact measurement. Interestingly, the worst ratings in the field of teaching entrepreneurship were received by employees associated with technology transfer, whose functions in the university are performed by the Industry Cooperation Office.

The results of the research point to the need to take action leading to changes in this area. Corrective initiatives may consist of:

- introducing organizational changes,
- setting goals,
- strengthening the competences of employees.

The following part of the article presents an analysis of the area related to teaching and learning entrepreneurship. The proposed activities are also presented, which are a compilation of both the proposals and suggestions of the study participants, as well as the authors' own experiences, and above all, the model solutions presented in the HEInnovate questionnaire.

8. Discussion

The introduction of organizational changes at the University of Silesia should lead to a fundamental reconstruction of educational curriculum towards the development of entrepreneurship. An extremely important clue in terms of reducing the differences in the level of entrepreneurship education between Polish and European universities may be the use of elements contained in the document of the European Commission entitled "(The European Entrepreneurship Competence Framework (EntreComp))" (European Union, 2018). The document describes 15 competences in 3 areas, which make up the so-called entrepreneurial mindset – namely, the intellectual ability to undertake entrepreneurial ventures, which are the core of learning about entrepreneurship. It also seems extremely important that the new study program should be based on the concept of entrepreneurial universities. It should equip students primarily with the ability to adapt to changing local and global market conditions and the ability to commercialize the acquired know-how. This model should also enable the inclusion of stakeholders from the business community in the management of the study program, the inclusion of "entrepreneurial achievements" in the evaluation criteria of academic teachers, as well as added value for students and cooperating businesses. Experiences from international cooperation also show that entrepreneurship education based on soft-skills in the

areas indicated by EntreCamp and project work on challenges and problems reported by companies cooperating with universities is common. The proposed module should include, among others: topics such as:

- business modeling, strategic thinking,
- practical team work on solving real problems,
- knowledge selling skills, self-presentation (the ability to make short speeches, so-called pitches),
- creative problem solving,
- time and self management,
- techniques for managing stress and taking care of mental well-being.

Managers of faculties related to the development of entrepreneurship should also strive to include stakeholders and business representatives in the management of studies and to engage in active cooperation with them in education. Enabling the development of students in the above areas will guarantee them a better start in their professional life, not only in their own company, but also in full-time work or freelance work.

The aim of activities in the context of entrepreneurship development should be to offer students and doctoral students the opportunity to prepare for work and life in an environment of diverse, interdisciplinary knowledge. The key competence offered to students and graduates, especially from humanities universities, should be the ability to:

- cooperation with graduates of other disciplines,
- the ability to understand their professional languages and
- adapting the languages of other disciplines for effective communication and collaboration.

When defining the goals of corrective actions, a modern university should always refer to the socio-economic environment. In the analyzed case, it may refer to the **DEVELOPMENT STRATEGY OF THE SILESIA VOIVODESHIP** (Wrana, 2013), which, as part of the SWOT analysis, developed priority areas for the development of a modern economy in the region.

The SWOT analysis conducted for the University of Silesia shows that a fairly large group of areas concerns the functioning of Silesian universities in the region, and thus the University of Silesia in Katowice. Table 1 summarizes those that have the strongest impact.

Table 1.*SWOT analysis, Priority areas of the Silesian Voivodeship regarding the Modern Economy*

| Strengths | Weaknesses | Opportunities | Threats |
|---|--|---|--|
| A strong scientific center and staff concentration scientific and a large number R&D institutions | Low level of cooperation and weak sector links R&D with other sectors (knowledge transfer) | Economy development based on knowledge | Growing competition between centers scientific |
| Significant position industry, ICT, and energy sectors, medicine, automotive, environmental protection using and creating new ones technologies | Low level of implementation Patents | "Fashion" for products regional | Downgrade education at universities higher caused commercialization of services educational |
| A growing sector creative industries (e.g. music, design) | Low tide high qualified staff | Perception of the region as possible location for European centers scientific | Rising labor costs and limiting tax investment opportunities companies |
| Big number registered regional products | Low "survivability" new enterprises | Role empowerment social economy as alternative form professional activity | The downturn caused economic crisis in world markets |
| A large and absorbent market sales | Weak correlation between fields of study a I need Employers | Easy flow of knowledge and solutions technological | Production relocation to other countries, e.g. parent companies or to lower countries production costs |

From this analysis, it can be concluded that:

- the region develops creative industries, and the University has a faculty of Arts and Educational Sciences and the Film School,
- the university offer programs in the ICT, environmental protection and energy sectors (Faculties of Science and Technology, Life Sciences),
- current education does not give students the tools to develop their initiatives and proactive attitudes,
- the problem of the region that the university can partially solve is the education of future entrepreneurs in order to increase the "survivability" of start-ups,
- social economy can provide new jobs for graduates of non-technical universities such as the Faculty of Social Sciences, Humanities, Law and Administration),
- growing competition and labor costs require a new approach based on interdisciplinarity and innovative solutions.

The modern, complex world needs dialogue with representatives of many disciplines so that the best decision can be made. As a result of the analysis of the needs of the region and the assessment of the level of entrepreneurship at the University of Silesia in Katowice, actions were proposed to develop the competences of academic and non-academic employees and students in the field of learning and teaching entrepreneurship (Table 2).

Table 2.

Proposed activities to develop the competences of the University of Silesia in the field of learning and teaching entrepreneurship

| Dimension and rating | Organizational changes | Objective | Actions |
|---|---|---|--|
| <p>The higher education institution provides a variety of formal learning opportunities to develop entrepreneurial thinking and skills. Rating 3.1</p> | <p>Implementation of a study concept based on new student-centred pedagogical methods and interdisciplinary and practice-based learning</p> | <p>Stimulation and development of entrepreneurial thinking and skills</p> | <p>Development of 15 competencies that make up the so-called entrepreneurial mindset – intellectual ability to undertake entrepreneurial ventures, which are the core of learning about entrepreneurship.</p> <p>Training program in the field of innovation and entrepreneurship based on the "flip class" method, thanks to which students learn and gain experience as part of the implemented business project and during classes, which helps to consolidate knowledge and look for answers to questions arising during the ongoing business project.</p> <p>Use Design thinking and interactive visual collaboration tools to develop creativity and innovative thinking - experimenting and learning through business simulations, practical application of knowledge</p> |
| <p>The higher education institution provides a variety of informal learning and experience opportunities to stimulate the development of entrepreneurial thinking and skills. Rating 2.9</p> | <p>Offer students informal learning opportunities consolidation and integration of research and development potential and competences in the scientific areas of Silesian universities</p> | <p>Stimulating the individual to entrepreneurship</p> | <p>Establishing an entrepreneurship club serving as a platform for members to find mentors, network or launch a startup.</p> <p>These clubs should host speakers, pitching events and entrepreneurial skills workshops.</p> <p>All undergraduate and graduate students, academics and non-academics will be welcome.</p> <p>Clubs are a learning-by-doing environment where members can develop their Design Thinking, Innovation and Entrepreneurship skills.</p> <p>Clubs should include three main activities: 1) lectures, 2) mentoring, 3) internships.</p> |
| <p>The higher education institution validates the entrepreneurial learning outcomes that drive the planning and implementation of the entrepreneurship curriculum. Rating 2.4</p> | <ul style="list-style-type: none"> • Regular review, recognition and updating of course content and learning outcomes for all study programmes. • Implementation of monitoring and quality assurance procedures | <p>Codification of entrepreneurship learning expectations in terms of knowledge, skills and competences</p> | <ul style="list-style-type: none"> • Conducting training in the field of start-ups by students and new employees start-ups. • Conducting a continuous process of evaluating learning outcomes. <ul style="list-style-type: none"> • Tracking and registration of emerging companies and partnerships. • Identification of ideas, opportunities and business models implemented as Hackathons. • Base of social challenges to solve |

Cont. table 2.

| | | | |
|---|--|--|--|
| <p>The higher education institution prepares and delivers the curriculum together with external stakeholders. Rating 2.7</p> | <p>Formal mechanisms enabling the employment of business practitioners. Establishing close cooperation with other Silesian universities in the form of consolidation of activities in the field of teaching entrepreneurship</p> | <p>Learning skills necessary in the labor market. Creating cooperation spaces and internal communication tools for effective cooperation</p> | <p>Conducting a stakeholder analysis, i.e. identifying the most important groups that will have an impact on the operation of the university in the field of entrepreneurship science. Preparation of the scope, issues and tools for the implementation of research in all selected groups of recipients and participants of activities. Involvement of business in educational activities and in the university structures</p> |
| <p>The educational offer in the field of entrepreneurship includes the results of research in the field of entrepreneurship Rating 2.7</p> | <p>Appointment of the updating team</p> | <p>Integrating entrepreneurial research into learning</p> | <p>Development of competences of people related to the implementation of university strategy in the field of entrepreneurship. Innovation and entrepreneurship training came to bring together innovational talent from different countries to innovate and create new companies through cooperation</p> |

9. Summary/Conclusion

The University of Silesia in Katowice has an enrollment of 16,520 full-time students and 3,460 part-time students and 1,135 doctoral students. It is staffed by 1,883 academic teachers and 1,369 administrative employees. It also provides initiatives for the broadly understood society, such as: University of Silesia for Children, Unibot (robotics and programming for children aged 7-12), University of Silesia of Youth, postgraduate studies, MBA programs, Teacher Training Block, University of the Third Age. It cooperates with foreign universities thanks to e.g. 255 bilateral agreements concluded in 61 countries (scientific and educational cooperation), 826 Erasmus+ exchanges concluded with 48 countries and 3,500 international mobility programs (data from 2022). Increasing the innovativeness of university services, including the development of entrepreneurship and innovation among staff and students, is essential for the intelligent economic development of the Silesian region. In this context, it also seems necessary to increase public awareness of the transformative potential of services in the field of education and entrepreneurship education.

The obtained results indicate that, the surveyed institution implements activities for teaching and learning entrepreneurship, albeit to a moderate or low degree. These activities, however, are not a permanent process and long-term results and effects are not studied. In addition, the respondents point very strongly to the lack of validation and evaluation of the results related to learning entrepreneurship. This result strongly corresponds to the weakest area obtained by the university in terms of impact measurement. The worst marks in the field of teaching entrepreneurship were received by employees involved in technology transfer.

The results of the research indicate the need to take action in the teaching and learning entrepreneurship area. This paper presents initial suggestions for solutions.

As a result of the conducted study, it can be concluded that the measurement of the level of entrepreneurship using the HEInnovate tool can be an important starting point for the implementation of a new entrepreneurship development strategy at the university. The HEI questionnaire contains eight areas of various university activities and can be used as a self-assessment tool. With the help of the tool, it is possible to identify the strengths and weaknesses of the university in terms of the strategy for teaching entrepreneurship as well as any other element of assessment, and use the results to base the university's development strategy towards the development of entrepreneurship and innovation.

In the process of conducted research, the possibility of further improvement of the tool, which is the HEInnovate questionnaire, was noticed in the field of implementation of international projects. It may turn out to be crucial not only for individual universities, but also for consortia developing a common model of entrepreneurship development and for alliances of European universities. The team of researchers sees the possibility of using HEInnovate to define strategic activities related to the development of entrepreneurship and innovation in universities which should result in ensuring the effects of synergy and cooperation between universities.

The purpose of the study was to provide detailed feedback to stimulate debate on the various statements in the HEInnovate tool and to help universities establish a benchmark for entrepreneurial development in their structures. However, it should be emphasized that, according to the authors, any corrective action at universities should, in each case, be combined with social dialogue to determine the needs of the regional and local economy, the labor market, and the characteristics and demographic trends that are crucial to the development of entrepreneurship in the regions. However, there is a lack of systemic coordination in activities between universities and partners from the world of science and the economy. Gaps in the current system indicate that the current activities of universities may not consider the new needs of students, the new profiles of graduates, and the career ambitions of doctoral graduates and young researchers. For their role as sustainable development engines, higher education units need a high level of autonomy and accountability mechanisms that allow for flexibility and agility.

Close links with strategic partners and the region are essential. Transforming traditional higher education units into innovative and entrepreneurial organizations is a complex and long-term undertaking. It is because the main obstacles lie deep within the higher education system and should be changed from within. To this end, an analysis of strengths, weaknesses, opportunities, and threats is needed, with the participation of the entire university community, including students, alumni, and key external partners. The HEInnovate tool is a great starting point for starting such a broad discussion at universities, simultaneously confirming the research hypothesis.

References

1. Abiyev, V. et al. (2013). Ekonomik Gelişme ve Girişimcilik, Girişimcilik. In: *Himmat Karadal*. İstanbul: Beta Basım.
2. Ackoff, R., Magidson, J., Addison, H.J. (2007). *Projektowanie ideału. Kształtowanie przyszłości organizacji*. Warszawa: Wydawnictwa Akademickie i Profesjonalne.
3. Acs, Z.J., Braunerhjelm, P., Audretsch, D.B., Carlsson, B. (2009). The knowledge spillover theory of entrepreneurship. *Small Business Economics*, 32(1).
4. Agrawal, A. (2006). Engaging the inventor: exploring licensing strategies for university inventions and the role of latent knowledge. *Strategic Management Journal*, 27(1).
5. Altmann, A., Ebersberger, B. (2013). *Universities in Change Managing Higher Education Institutions in the Age of Globalization*. Springer.
6. Andrews, D., Nicoletti, G., Timiliotis, Ch. (2018). Digital technology diffusion: A matter of capabilities, incentives or both? *OECD Economics Department Working Papers*, 1476.
7. Andrzejczak, A. (2015). Uniwersytet przedsiębiorczy i odpowiedzialny społecznie. *Edukacja Ekonomistów i Menadżerów*, 4(38).
8. Augustyńczyk, J. (2020). Przedsiębiorczość w wybranych teoriach ekonomicznych. In: E. Gruszewska (ed.), *Współczesne problemy ekonomiczne w badaniach młodych naukowców, t. 4, Teoria i praktyka*. Wydawnictwo Uniwersytetu w Białymstoku.
9. Bańko, M. (ed.) (2000). *Inny słownik języka polskiego*. Warszawa: PWN.
10. Borch, O.J., Rasmussen, E. (2010). University capabilities in facilitating entrepreneurship: A longitudinal study of spin-off ventures at mid-range universities. *Research Policy*, 39(5).
11. Carayannis, E.G., Barth, T.D., Campbell, D.F. (2012). The Quintuple Helix innovation model: global warming as a challenge and driver for innovation. *Journal of Innovation and Entrepreneurship*, 1(2).
12. Chmielnicka, E. (2008). Kilka uwag o etosie i kodeksach akademickich oraz o odpowiedzialności uczelni. In: K. Leja (ed.), *Spoleczna odpowiedzialność uczelni*. Politechnika Gdańska.
13. Clark, B. (1998). *Creating Entrepreneurial Universities*. Oxford: Elsevier.
14. Ćwiklicki, M., Pilch, K. (2018). *Methodological Rigour of Multiple Case Study Research in Place Marketing*. Cracow University of Economics.
15. Czaja, I., Kafel, T. (2020). Pomiar wdrażania koncepcji przedsiębiorczego uniwersytetu. *Przedsiębiorczość – Edukacja*, 16(1). Kraków.
16. Dogan, N. (2015). *The Intersection of Entrepreneurship and Strategic Management: Strategic Entrepreneurship*. Istanbul: Istanbul University, Faculty of Economics.
17. Etzkowitz, H. (2002). *MIT and the Rise of Entrepreneurial Science*. London: Routledge.
18. Etzkowitz, H., Leydesdorff, L. (1999). The Future Location of Research and Technology Transfer. *The Journal of Technology Transfer*, 24(2-3).

19. European Union (2018). *The European Entrepreneurship Competence Framework (EntreComp)*. Luxembourg: Publications Office of the European Union.
20. Freeman, Ch.(1982). *The economics of industrial innovation*. London: F. Pinter.
21. Friedman, J., Silberman J. (2003). University Technology Transfer: Do Incentives, Management, and Location Matter? *The Journal of Technology Transfer*, 28(1), 17-30.
22. Gibbons, M. et al. (1994). *The new production of knowledge. The dynamics of science and Research in Contemporary Societies*. London: SAGE Publications.
23. Gjerding, A.N., Wilderom, C.P.M., Cameron, S.P.B., Taylor, A., Scheunert, K.J. (2006). Twenty Practices of an Entrepreneurial University. *Higher Education Management and Policy*, 18(2).
24. Glachant, J.M., Haywood, J., Zorn, A. (2018). *Higher Education in the Digital Age. Moving Academia Online*. Cheltenham: Elgar Publishing.
25. Głuszczyk, D. (2002). Finansowanie działalności innowacyjnej przedsiębiorstwa. In: *Determinanty innowacyjności przedsiębiorstw*. Szczecin: Wydawnictwo Naukowe Uniwersytetu Szczecińskiego.
26. Güney, S. (2008). *Girişimcilik-Temel Kavramlar ve Bazı Güncel Konular*. Ankara: Siyasal Kitabevi.
27. Haller, E., Stott, L. (2010). *Studium przypadku – poradnik*. Kraków: Wydawnictwo Spektrum.
28. Jabłeczka, J. (2002). *Koordinacja badań naukowych*. Warszawa: Uniwersytet Warszawski, pp. 25, 188-205.
29. Janasz, W., Kozioł, K. (2007). *Determinanty działalności innowacyjnej przedsiębiorstw*. Warszawa: PWE.
30. Jasiński, A.H. (2021). *Współczesna scena innowacji*. Warszawa.
31. Kusio, T. (2019). *Więzi relacyjne uczelni z biznesem*. Kraków: Wydawnictwo Akademii Górniczo-Hutniczej w Krakowie.
32. Kwiek, M. (2015). *Academic Entrepreneurialism and Changing Governance in Universities. Evidence from Empirical Studies*. Springer.
33. Leja, K. (2013). *Zarządzanie uczelniami. Koncepcje i współczesne wyzwania*. Warszawa: Oficyna Wolters Kluwer business.
34. Leja, K. (2008). Uniwersytet organizacją służącą otoczeniu. In: K. Leja (ed.), *Społeczna odpowiedzialność uczelni*. Politechnika Gdańska.
35. Leja, K. (2011). *Koncepcje zarządzania współczesnym uniwersytetem*. Gdańsk: Wydawnictwo Politechniki Gdańskiej.
36. Makiela, Z.J. (2017). *Model Uniwersytetu Trzeciej Generacji XXI wieku - przedsiębiorczy, innowacyjny uniwersytet*. Folia Oeconomica Cracoviensia, PAN.
37. Markowski, A. (ed.)(2000). *Nowy słownik poprawnej polszczyzny*. Warszawa: PWN.

38. Micieta, B., Turekova, H. (2011). Innowacje w nowoczesnych systemach zarządzania. In: J. Juraszek, A. Moczala, *Innowacyjność akademicka – nowe wyzwanie dla nauki i przedsiębiorczości*.
39. Mizerek, H. (2017). Studium przypadku w badaniach nad edukacją. Istota i paleta zastosowań. *Przegląd Pedagogiczny*. Uniwersytet Warmińsko-Mazurski.
40. OECD (2005). *Oslo Manual*. Paris.
41. Pluta-Olearnik, M. (ed.) (2009). *Przedsiębiorcza uczelnia i jej relacje z otoczeniem*. Warszawa: Difin.
42. Polański, E. (ed.) (2008). *Wielki Słownik Języka Polskiego*. Kraków: PAN.
43. Romanowski, R. (2011). Znaczenie innowacji w gospodarce opartej na wiedzy. In: B. Borusiak (ed.), *Innowacje w marketingu i handlu. Zeszyty Naukowe, no. 184*. Wydawnictwo Uniwersytetu Ekonomicznego w Poznaniu.
44. Schumpeter, J.A. (1960). *Teoria rozwoju gospodarczego*. Warszawa: PWN.
45. Schumpeter, J.A. (1994). *Capitalism, Socialism and Democracy*., London/New York: Routledge.
46. Sporn, B. (1996). Managing University Culture: An Analysis of the Relationship Between Institutional Culture and Management Approaches. *Higher Education, 32(1)*.
47. Sulejewicz, A. (2003). Pług, miecz i księga: otoczenie szkoły wyższej. In: B. Minkiewicz (ed.), *Uczelnie i ich otoczenie: formy i możliwości współdziałania*. SGH.
48. Sulejewicz, A. (2008). Paradoks społecznej odpowiedzialności biznesu szkoły wyższej. In: K. Leja (ed.), *Spoleczna odpowiedzialność uczelni*. Politechnika Gdańska.
49. Sutz, J. (1997). The New Role of the University in the Productive Sektor. In: H. Etzkowitz, L. Leydesdorff (eds.), *Universities and the Global Knowledge Economy. A Triple Helix of University – Industry – Government Relations*. London/Washington: Pinter.
50. Szajt, M. (2008). Aktywność innowacyjna a struktura finansowania – analiza przestrzenna. In: E. Okoń-Horodyńska, A. Zachorowska-Mazurkiewicz (eds.), *Tendencje rozwoju innowacyjnego przedsiębiorstw*. Warszawa: Instytut Wiedzy i Innowacji.
51. Tidd, J., Bessant, J. (2011). *Zarządzanie innowacjami*. Warszawa: Wolters Kluwer.
52. Toczyńska, J. (2015). Innowacyjność usług edukacyjnych i uczelni. *Zeszyty Naukowe Politechniki Śląskiej, no. 78*. Politechnika Śląska.
53. Vertova, G. (ed.) (2006). *The Changing Economic Geography of Globalization*. London/New York: Routledge.
54. Wawak, T. (2017). *Zarządzanie w szkołach wyższych i innowacje w gospodarce*. Wydawnictwo Uniwersytetu Jagiellońskiego.
55. Wawrzyniak, B. (1999). *Odnawianie przedsiębiorstwa na spotkanie XXI wieku*. Warszawa: Poltext.
56. Wrana, K. (2013). *Strategia rozwoju województwa śląskiego Śląskie 2020+*. Wydział Planowania Strategicznego i Przestrzennego, Urząd Marszałkowski Województwa Śląskiego.