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Role of Competences of Graduates in Building Innovations via Knowledge Transfer in the Part of Carpathian Euroregion

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Abstract: Cross-border cooperation within the framework of the Carpathian Euroregion provides the possibility of building the processes of education at universities that would facilitate knowledge transfer from the universities to the business sphere, which is particularly significant in terms of forming innovations. The aim of the research conducted was the analysis of the key competences that have an impact on the level of innovativeness of the graduates of the universities of a business profile in Poland, the Czech Republic, Slovakia, and Romania. In the methodology used, a systematic literary review of the acquired references from the databases of ProQuest, Emerald, SCOPUS, and the Jagiellonian Library was applied from the outset. Subsequently, a small number of foreign and Polish research works conducted in the sphere of the stipulated subject matter of the competences of graduates, as well as their innovativeness were identified and ascertained. This facilitated the specification of the cognitive gaps as follows: There was no prior research relating to the Carpathian Euroregion and the transnational cooperation, with particular consideration given to the role of graduates of universities in terms of shaping change in this area. In empirical research, a survey method was chosen as it enabled, among other things, the quantitative description of specific aspects declared as the competences of graduates in the chosen research group. The research conducted reveals that there are no stipulated ways of ranking the essential competences directed at innovativeness, thus the decision-makers at the universities in the Carpathian Euroregion must consider what way and what activities they may use to connect the development of competences. The results acquired and the conclusions drawn may serve the transfer and adoption of good practices from individual countries and regions to other European and non-European ones.

Keywords: competences of graduates; Euroregion; cross-border cooperation; innovation; knowledge transfer

1. Introduction

For a long time, the state borders and adjacent regions have been aimed at separating lands, people, nations, notions, or activities. By way of consequence, the identification and use of the common features, convergences, and divergences of the areas located on both sides of the borders are both the causes and opportunities of cross-border cooperation [1]. Regional and Euroregional cooperation signifies cooperation between the member states and the partnering countries that undertake common challenges that are in turn, aimed at the common good that takes place in the territories of the member states and the partnering countries [2].

Euroregions should ensure a clear strategic vision of their territories that encompasses a legislative nature, which would be best in the type structure of European Groupings of Territorial Cooperation,

sharing social infrastructure, strong participation of the local communities in issues of cross-border cooperation, while also strengthening public organizations, education and higher-level education, as well as enterprises [3,4].

The possibility of undertaking and conducting a satisfying job on the part of the students and graduates, which is convergent with their profile of education, is influenced by a range of factors, particularly supply and demand for work in the Carpathian Euroregion. Nevertheless, the level of competences as a result of the education profile and its convergence with the expectations of employers who are geared towards innovativeness that is built as a result of the knowledge transfer from the new employees also has a significant impact.

Competences as a set of knowledge, professional experience, and skills constitute the essence of building the innovative solutions in organizations. This is particularly important in a cross-border area where there would be a flow of labor force between the particular countries. Hence, the cross-border cooperation of universities is especially important in terms of building programs of teaching that are desirable on the labor market and would facilitate the free movement of university graduates to organizations where they intend to become employed. In the sphere of specifying the competences that are necessary on the market, dialogue is necessary to undertake in the area of cross-border cooperation between the universities and the employers.

The identification of the experience of the cross-border countries of the Carpathian Euroregion facilitates the appropriate building of the processes of education at universities, which in turn, facilitates the identification of the most helpful and useful programs aimed at young people entering the labor market.

The aim of the research conducted was the analysis of the key competences that influence the level of the innovativeness of the university graduates of a business profile in Poland, the Czech Republic, Slovakia, and Romania. The presented research is the first part of an international project that will be continued. The pandemic made it impossible to carry out the research planned for this year in Ukraine and Hungary. Only then, after completing the entire research, will it be possible to present the results in a multi-layered manner. The authors decided that, despite the current problems, it is worth presenting the first part of the research. We also plan to publish two monographs after the end of the project: One scientific and the other will be a guide to implementing good practices.

2. Systematic Literary Review

The research commenced with a systematic literary review, which was significant in terms of identifying and ascertaining the chosen subject matter for research, which facilitated the contextualization of research in subject-related literature. With the aim of finding the fundamental subject-related literature for the research, the following publication sources were availed, which contained full-text sources: ProQuest, Emerald, SCOPUS. As a result, access was gained to the current and significant journals and publications of an international scope. Subsequently, a selection was made on the basis of the following key words: Euroregion, innovations, knowledge transfer, competences, and the labor market. The source material accumulated was narrowed down to the list of publications that included fully reviewed works, while also excluding such works as communiques, conference presentations, and book reviews. Repetitive sources were also excluded. Finally, analysis was conducted of the content on the basis of the abstracts by narrowing down the references to the field of science on management. A form of methodics was adopted that facilitated the accumulation of material sources that were significant for further analysis. The documental material prepared was expanded by a further stage relating to Polish scientific publications of both monographs and reviewed papers in leading Polish journals stored in the Jagiellonian Library. In its statutory aims, this library has the obligation to accumulate the output of Polish scientists, thus it is one of the largest and most updated sources for the purpose of reviewing Polish references (see: Table 1).

Table 1. Biometric analysis based on the keywords.

Base Name	Total Number of Publications	Including the Number:				Selected on the Basis of the Abstract Content Analysis
		Articles	Reviewed and Full Texts	In Scientific Journals	In English Language	
Euroregion, innovations, knowledge transfer, competences and the labour market						
ProQuest	2033	1893	174	171	129	108
JSTOR	253	219	187	24	200	62
SCOPUS	1314	837	93	89	93	33
Jagiellonian Library	121	89	89	73	0	17

Source: Self-analysis.

In the next stage of the systematization of the literature, the obtained references were subjected to a full content analysis—the quality of the obtained publications was determined (rejecting unnecessary from the point of view of research goals), then systematized and organized based on the adopted assumptions of keywords, which finally allowed to identify the cognitive gap and show the extent to which management issues in Euroregions and knowledge transfer related to competence building are present in books and peer-reviewed scientific journals. It was also possible to identify areas both determining and related to these issues.

The references acquired were stipulated in the subsequent stage of the systematization of literature in a complete analysis of the content, whereby the quality of content of the publications was established (rendered unnecessary from the viewpoint of the research aims), while subsequently systemized and ordered on the basis of the assumptions of the key words adopted, which ultimately facilitated the stipulation of the cognitive gaps. There is no such formulation of the problematic issues of innovativeness in the hitherto scientific publications, which are built as a result of the deliberate shaping of the competences of the graduates of the universities. This subject matter is dispersed in the references and episodic works collected.

On the basis of the documental analysis conducted, research methods were suggested, which are applied in further empirical research (both during the research, as well as in the interpretation of the findings).

3. Carpathian Euroregion

The notion of cross-border cooperation and the Euroregion, which are frequently used interchangeably, indicate the area of cooperation between local and regional authorities directly located at the border, or within its environs and in cooperation with various sectors [5]. This area was established with the aim of promulgating common interests across borders and cooperation on behalf of the common prosperity of nations in the cross-border areas [6,7].

The Carpathian Euroregion was established in 1993 with the aim of supporting cross-border cooperation between Poland, Slovakia, Hungary, Ukraine, and Romania. The area of the Euroregion encompasses approximately 154,000 km² and is populated by over 15 m people [8–10].

The fundamental feature of the functioning of the Carpathian Euroregion has been, for many years, the lack of a legislative nature as an Association as a whole, or its particular Domestic Sides. The definition of the Carpathian Euroregion is thus placed in political categories, albeit the Statutes of the Association specify its territorial range and describe its organizational structure [9,11].

The area of the Carpathian Euroregion is one of the most attractive and differentiated geographical areas in Central Europe. Its specifics create modern regions of a low level of socio-economic growth both with reference to the regions of the countries involved and the European scale. The enormous potential inherent in the human resources, natural riches, and cultural heritage is still not appropriately availed. An additional aspect that may be an obstacle depending on the approach, as well as an attribute is the fact that the region of the Eastern Carpathy is divided by the external border of the

EU. In turn, the political significance of the partnership with Ukraine for each of the adjacent states (particularly Poland) is of a strategic dimension [10,12].

The surface area of the Carpathian Euroregion covers [9]:

- Part of Ukraine—around 36.6%,
- Romanian part—approximately 23.1%,
- Hungarian part—approximately 18.5%,
- Polish part—approximately 11.6%,
- Slovakian part—approximately 10.2%.

The territory of the Carpathian Euroregion encompasses the poorly developed part of each country that is part of this Euroregion. These are peripheral areas that are poorly developed from an economic viewpoint, while also burdened with a high rate of unemployment and poverty. The largest cities of the Carpathian Euroregion are Debreczyn and Miskolc in Hungary, Satu Mare and Baia Mare in Romania, Koszyce and Preszow in Slovakia, Czerniewice, Iwanowo-Frankowsk, Lwów, and Użgorod in Ukraine, and Krosno and Przemyśl in Poland [9,13].

The Carpathian Euroregion is an area in which a multitude of cultures and ethnic minorities overlap. In Ukraine, there is a large Polish minority group, while in Romania and Slovakia, there is a Hungarian minority group, whereas the Romani ethnic group live in all parts of the Euroregion and in certain parts there are also such ethnic groups as Lemkos, Boykos, Huculs, Pogorzans, Saxons and others. The territory of the Carpathian Euroregion thus constitutes a cultural mix, but also a religious mix. Three different Christian observances are mainly evident here: Roman Catholic, Greek Orthodox, while also Calvinists to a lesser degree, followers of the Mosaic religion, Muslims, Protestant, and others, which exerts a huge impact on the process of Euro-regionalization [14,15].

In the Carpathian Euroregion, there is a prevalence of cities numbering up to 50,000 people. Inhabitants constitute 92.6% of the general number of cities, albeit 48.4% are of the general urban population. In the Polish part of the Euroregion, there are five cities that are populated by over 50,000 inhabitants: Rzeszów, Przemyśl, Stalowa Wola, Mielec, and Tarnobrzeg. In the Romanian part, there are six cities of this nature: Oradea, Baia Mare, Botosani, Satu Mare, Suceava, and Zalau. In the Slovakian part, there are three cities of this type: Koszyce, Preszów, and Poprad. In the Ukrainian part, there are 10 such cities: Lwów, Czerniowce, Iwano-Frankowsk, Użgorod, Drohobycz, Czerwonogród, Mukaczewo, Kałusz, Stryj, and Kołomyja. However, in the Hungarian part, there are five cities of this nature: Debreczyn, Miskolc, Nyiregyhaza, Szolnok, and Eger (Population of the Carpathian Euroregion) [13,14].

Great expectations for the development of the areas of Carpathy were instilled by the process of European integration, as well as the associated hopes for the financial support of investments, while also cooperation with the EU budget. Unfortunately, it is possible to conclude that up to now the support for the areas of Eastern Carpathy arising from the expansion of the EU is of a rather small dimension. Apart from the pilot financial instruments in the sphere of the pre-accession period (PHARE CBC, TACIS CBC), as well as the first operational programs executed within the framework of the Inicjatywa Wspólnotowa INTERREG IIIA (INTERREG IIIA Community Initiative) and the imperfect Neighborhood Programs, no specific program supporting the development of Eastern Carpathy functioned at all, not only from the viewpoint of an investment dimension, but also in the sphere of multilateral support for interpersonal and institutional cooperation, or common conceptual work projects [8,16].

In order for cross-border cooperation to prosper, it is essential to create a professional structure that is based on national associations of self-governing units of cooperation, while ensuring such institutional and procedural solutions for this structure that guarantee the actual coordination of activities, while also ensuring the ability of the organization to manage the serious tasks on behalf of the EU [17]. Another medium-term goal that is possible to distinguish is the preparation of the common Development Strategy for the Carpathian Euroregion, which determines the strategic directions of the

development of the Euro-region, while also indicating the priorities and activities, as well as first and foremost constituting the basis for the synchronization of the preparation of the national and regional programs, while also the “Carpathian Spatial Programme” [9,18].

The countries of the Euroregion indicate great activity in the sphere of regional cooperation, which is multi-faceted and gives rise to increasing benefits for local self-governing units, entrepreneurs, non-government organizations, while also the sphere of R&D (Table 2).

The Carpathian Euroregion constitutes a distinctive structure of cooperation between states that had regained independence in the recent past (Ukraine), by winning political and economic freedom from the influences of Russia. Its functioning is associated with numerous measurable benefits that may be listed as follows: Increasing investments, the inflow of foreign capital, the development of labor markets, and the nullification of the socio-economic disproportion in terms of increasing the dynamics of economic growth by means of building innovations.

Table 2. Benefits from cooperation with the Carpathian Euroregion.

Benefits of Euro-Regional Cooperation	
For self-government entities	<ul style="list-style-type: none"> • participation in prestigious group of self-governments that cooperate on behalf of creating a common socio-economic space in the Carpathian region, • possibility of availing knowledge and experience of the team coordinating the implementation of the Carpathian brand in the sphere of the development of tourism and marketing, • encompassing area of local self-government into promotion aid in the sphere of product brands, events and tourist services, as well as including entities into the area of the local self-government, • possibility of gaining support for development initiatives in the form of tools and mechanisms for the Carpathian Euroregion, • coordination of the preparation of propositions of projects for financing from EU funds, • availing international (European and worldwide) partnership ties in the Association of Carpathian Euroregion Poland.
For entrepreneurs	<ul style="list-style-type: none"> • possibility of including their own products and services into the offer of the Carpathian brand based on the principle of certification, • training support and promotion support encompassing multilateral activities at an international level in multiple innovative forms, • including educational policies and exchange of Alpine-Carpathian experiences based on the principle of the Polish-Swiss partnership on the basis of the functioning of the Alpine-Carpathian Tourist Cluster of Knowledge, • aid in gaining foreign markets within the framework of the policies of international cooperation of the Carpathian Euroregion, while also availing the support of pro-export mechanisms.
For non-governmental organizations	<ul style="list-style-type: none"> • possibilities of acquiring support for the initiatives undertaken in the form of the tools and mechanisms of the Carpathian Euroregion, • promotion support for activities conducted within the framework of the information policies of the Carpathian brand, • possibility of acquiring substantive support for conducting activities by means of the information channels and mechanisms of cooperation in the Carpathian Euroregion, • possibility of initiating and supporting international cooperation in terms of development, possibility of gaining partners for cooperation in the regions of the Carpathians and the Alps, • possibility of participation in the Carpathian Forum of Non-Governmental Organizations—a platform of Carpathian NGO cooperation, • possibility of economization and commercialization of the activities of non-governmental organizations on the basis of participation in the business model of Carpathian brand.
For R&D sphere	<ul style="list-style-type: none"> • cooperation with institutions in the execution of activities of a scientific and research nature, • possibilities of acquiring support for activities in the form of the tools and mechanisms of the Carpathian Euroregion, • possibility of cooperation between the Carpathian and Alpine scientific and research partners within the framework of the Alpine-Carpathian Tourist Cluster of Knowledge, • possibility of availing the experiences of the foreign partners of the Carpathian Euroregion in the sphere of education at all levels, particularly in the context of adjusting the educational offer to the needs of the labour market.

Source: Self-analysis (own research (practical verification of information contained in the sources: [1,3,4,8,15,18]).

4. Building Innovations

Innovations constitute an important impulse that are defined contemporarily as the decisive resource of enterprises and regions that favor the building of a competitive advantage at a local and international level. Innovations are of a social dimension, while also being the impulse for the market process of education whose aim is the creation of talents. The significance of employee talents in the practice of the management of enterprises is growing, which is testified to by the strategies of talent management [19]. Researchers and practitioners assume that employee talents are a collective category that encompasses the features of the members of an organization, which in turn guarantees the achievement of exceptional results in work positions, especially innovative and breakthrough discoveries that are the derivative of initiatives, intuitions, creative thought, involvement, and diligence [20].

In the context of the afore-mentioned definitions, a significant aspect is the identification of the sources of acquiring and acceleration of talents. Enterprises that indicate innovativeness as the key challenge for the future of their organizations, as well as searching for talent, seeking opportunities for development in terms of cooperation with R&D centers, in which there are favorable conditions for “building” talents that are concentrated on innovative start-ups. Start-ups are innovative entities that are created by excellent students, scientific employees, and graduates. They illustrate enormous creativity, create innovative organizational structures, turquoise organizations, build transnational networks of cooperation, perceive market niches, while also undertaking risk. Cooperation and competition enable them to implement new solutions, compete with each other, and learn from each other in mutual fashion [21]. These activities form the paradigm of open innovations that assume that enterprises should avail both internal and external ideas, while also the routes to market access [22].

Jiao, H., Zhou, J., Gao, T., and Liu, X propose the concept of regional systems of innovation consisting of two parts: A regional structure of production or sub-system of utilizing knowledge (primarily firms), while also the regional support infrastructure or sub-system of generating knowledge (public and private research laboratories, universities and colleges, agencies of technology transfer, organizations of professional training, and other research organizations) [23]. Universities are important elements in such systems of regional innovations, especially in terms of providing knowledge to business and the community itself [24].

For many years we have observed among universities and corporations the growing expenditure on research and development, in which the effect is the dynamic growth of innovations. Innovations require significant financial outlays, as well as specialized knowledge. The factor that combines these two worlds is the commercialization of the findings of scientific research that is conducted at universities. Nowadays in Poland, really high potential is evident in this area. Science and technology parks, some corporations, private firms, or dedicated trust funds invest in the technologies of the future, whereby they realize that the potential return on investment shall occur after several years or more than a decade [25].

Young innovative technological firms fulfil the role of catalyzers of innovation on the market. They bring the market under control in a relatively easy and straightforward manner with technological novelties and make it accustomed to new business models. As indicated by research, out of 10 start-ups, only 2 achieve spectacular success, albeit they open the door to success for others. By assuming that a start-up is an innovative organizational structure, it avails modern technologies, particularly ICT. Start-ups are the result of changes that occur in the world with regard to the “digital revolution”. Never before has knowledge, communicative possibilities, while also computing power been so easily accessible and widespread. Everyone who has an idea has the opportunity to make it become reality by building a business model from scratch, checking the market reaction, and adjusting to it. Access to the market and clients has become more democratic as its popularity only depends on the quality of the product and the idea of the creators [26].

Start-ups are first and foremost featured by agility in terms of taking action, flexibility of their business model, while also high level of adaptability. They do not usually possess much capital,

which in turn forces them to employ maximum efficiency. As a new business, they start out without encumbrance, without an overgrown and decaying organizational structure, while also based on modern IT solutions. By commencing from an idea, they fill the market gaps straight away, unnoticed by the large market players, or deemed by them to be unprofitable. The advantages of start-ups lead to the fact that they are fragile and vulnerable enterprises. This is the result of the genesis of their formation, which is associated with their creators and managers. They are most frequently established by students and graduates of universities and are often supported by corporations and home universities that base their business model in part on their activities. The majority of start-ups in the subsequent stages of development require a large partner, not only due to the need for access to capital, but also due to the specialized knowledge, support in terms of fulfilling the regulatory requirements, and expansion on foreign markets. In return, start-ups enable universities to participate in international business, and corporations may explore previously inaccessible markets. Apart from the advantages of business start-ups, they frequently fit in with the idea and requirements of sustainable development. The idea from where everything originated arose from the observed need, or lack of agreement for the existing status quo. A start-up desires to lead to breakthrough changes in a place where others agree to maintain the existing situation. By means of their activities, they change the reality, or urge others to reflect [27].

Innovative technological forms are entities of academic entrepreneurship that are the new dimension of entrepreneurship that is developed at the crossroads between science and the economy, which break through the relatively widespread style of thinking that conducting your own firm and commercial attempts are in contrast with the principles of research work and university traditions, while simultaneously being inappropriate for the representatives of the scientific environment. The hitherto university model based on education and scientific research was expanded by preparation for entrepreneurship, which is perceived as the formation of pro-active behavior that facilitates independent activity on the market.

5. Knowledge Transfer from University

The acquisition of knowledge, as well as advanced skills and competences is increasingly seen as a significant element in the strategic thinking of the organization of employers and governments [28]. This particularly relates to the strategies and policies that should be integrated with the national financial structures, while also the achievement of sustainable development and competitiveness [29]. Economic growth based on knowledge is currently strongly promoted by the EU in a regional context [30], which, in turn, leads to the necessity of building systems of education that are geared towards learning and the development of specific skills that are essential in particular marketplaces. This facilitates the creation of a labor force and society that may support activities that generate prosperity based on knowledge.

Traditional universities play an important role in shaping the competitive profile of nations and regions. The development of the regional innovation systems (RIS) is supported by the European Commission, which is trying to make Europe and the EU the most competitive and dynamic economy in the world, which encompasses the whole chain of innovations ranging from education to the economic impact, popularly known as the “triangle of knowledge”, namely education, research, and innovation [31]. Likewise, the majority of researchers share the general idea that regionalization ensures the best context for a globalizing economy that is based on innovations with regard to the localized interactive learning processes and knowledge transfer based on the social interactions [32].

Knowledge transfer is measured by revenue from the sector, patents, joint publications with industrial partners and spin-off firms, whereas regional involvement is measured by graduates working in the region, student apprenticeships, joint regional publications, and income from regional sources [33].

Universities play a key role in the ecosystem of innovations (see research by Etzkowitz and Leydesdorff [34]). In such a manner, their mission is not limited to research and education, but encompasses a “third” dimension, namely, leading to the economic growth of their regions

(see research by Branscomb, Kodama, and Florida [35]). This is how universities support the processes of knowledge transfer [36].

The hitherto research conducted first and foremost concentrated on illustrating the gaps in the competences of graduates (leading to the inability to transfer knowledge from the university to the labour market) such as the following: The lack of initiative, weak interpersonal skills, low level of business awareness, and poor skills of teamwork (see research by, among others, Harvey, Moon, and Geall [37]; Williams and Owen [38]; Rajan, Chapple, and Battersby [39]; Conway and Baines [40]). Only after analysis was conducted by Pittaway and Thedham [41], as well as Holden, Jameson, and Walmsley [42] did positive ideas come out, which were frequently after just short periods of the involvement of the graduate and became transferred to the area of practice. However, the research of the authors was conducted on a sample of exclusively small and medium-sized enterprises that employ university graduates. It is a similar situation to subsequent research and despite the fact that they acknowledged Salminen-Karlsson and Wallgren [43] in their research, they however indicate the role of the graduates as the so-called border points in terms of transferring knowledge between the universities and the sector of enterprises. Such cooperation is not only aimed at the growth of the business indicators, but also educational factors.

Kruss, Adeoti, and Nabudere show the existence of the need for new theoretical, empirical, and political works in the sphere of the support of universities and their role in economic development [44]. Economic growth and social needs require investments in human capital by means of specifying the roles of universities in these processes. The more social investments conducted within the framework of the higher education system, the greater the success to be achieved in the future [45]. Moreover, the role of the academic environments and graduates involves the coordination and training of the local community by means of transferring knowledge and skills that are necessary in order to fill the gap between the economy and the development of the community. Some research indicates that the aforesaid factors should be of a sectoral nature (see among others, sectoral research (Santoro and Chakrabarti [46]), while others deny this theory (see research by, among others, Salminen-Karlsson and Wallgren [43]).

The concept of Knowledge Transfer Partnership (KTP) encourages learning based on not only the classic approach to studying, but to supplement it with a practical tool that enables employers, academic employees, and students to gain benefits from learning by means of experience in the actual workplace [30,47]. The aim of KTP is to check the abilities of the academic environment and the graduates and apprentices to transfer knowledge and skills they acquired at universities to society and industry [48]. Transferring this knowledge and the research findings has significant value that may be accepted and appreciated by society in the particular regions, including the Carpathian Euroregion.

6. Competences of Graduates on Labour Market

Changes in the modern workplace evoked by technology, innovations in management, and the increased competition on the global market provoked many fears relating to the adequacy of the competences of the future employees. It is worth considering the definition of competence at this point. In subject-related literature, it is possible to find a significant number of definitions of this notion. The chosen meanings are presented in Table 3.

Table 3. Definitions of competences from perspective of various authors.

Author	Definition
D.C. MacClelland [49]	Evaluation on the basis of the analyzed key aspects of behavior of a particular person that decides on whether the activities are more or less efficient.
R. Boyatzis [49]	The existing potential in a person leading to such behavior, which in turn leads to the fulfilment of requirements that are associated with a particular work position within the framework of the parameters of the environment of the organization at hand, which in turn brings the expected benefits.
T. Oleksyn [50]	Internal motivation, abilities and predisposition, education and knowledge, experience and practical skills, health and condition, other psycho-physical features that are important from the viewpoint of the work processes, attitudes and behavior expected in the place of employment, while also formal authorization to take action.
D. Thierry, Ch. Sauret [51]	Ability of an employee to take action leading to the accomplishment of a goal in the particular conditions with the aid of the specified means.
M. Sloman [52]	Ability to execute activities within the framework of a task area in the pursuit of the levels of executing the work expected from those employed.
D.D. Dubois, W.J. Rothwell [53]	The features of a particular person who avails them in an appropriate and consistent manner with the aim of achieving the expected results. These features include knowledge, skills, certain aspects of perceiving himself/herself, social behaviour, features of character, thought patterns, attitude and way of thinking, feelings, and procedure.
B. Mansfield [54]	Set of features of a particular person that decides on whether he/she achieves good or above-average effects at work.
M. Kossowska, I. Sołtysińska [55]	Basis of competence is knowledge located on three levels as follows: declarative knowledge (I know what), skills perceived to be procedural knowledge (I know how and I can do it) and attitudes (I want to and I am ready to use my knowledge).
S. Chępa [56]	Range of organizational authorizations which were attributed to a specific workstation in a formal way.
M. Juchnowicz, T. Rostkowski [57]	Knowledge, skills, experience, abilities, ambition, values, styles of activity
H. Król [58]	Predisposition in the sphere of knowledge, skills, and attitudes, ensuring the execution of professional tasks at an effective level and/or distinctive and appropriate to the standards specified by the organization for the particular position.
M. Fyczyńska, Ch. Ciecierski [59]	Competences of employees are their individual attributes, which are developed and optimized in order to achieve the desired results.
T. Rostkowski [60]	Knowledge, skills, predisposition, and motivation of employees that are availed and developed in the work process and serve to execute the strategies of the organization.
M. Lombardo, R. Eichinger, H. Levinson, J. Kouzes, B. Bass [61]	Measureable characteristics associated with professional success.
M. Szczęsna [62]	“In accordance with the approach applied in TP Group, competence is knowledge, skills or attitudes that are expressed in behaviour and have an impact on the level of efficiency at work.”

Source: Self-analysis on the basis of the references indicated (The systematization of the concept of competence was carried out as part of another research project, which confirmed the importance of graduates' competences in building their competences, see monograp: I. Stańczyk, Nowe trendy w doradztwie personalnym zawodowym).

In the context of describing the competences of university graduates, trends that are set out for several years or over a decade into the future are of significant importance. A set of such competences was defined by the World Economic Forum, together with HR managers who predict what skills employers will be looking for in the future [63]:

- Comprehensive solving of problems—the skill of analyzing a multitude of data and information, undertaking decisions, and implementing solutions.
- Critical thinking—the skill of logical perception and cold analysis.
- Creativity—this shall be an absolutely key skill not only in the sectors which it is associated with today, such as the media or entertainment, but everywhere. Work opportunities shall be waiting for those people who think in a non-standard and innovative way, as they shall be able to think up of new services and products in rapidly changing times.
- Management of people—teamwork shall become more important on the labor market. Employers shall need leaders—empathic leaders that are in control of body language and who have the skill to communicate with people clearly.
- Cooperation with others—flexibility, not insisting on their own opinion, while also openness towards co-workers.
- Emotional intelligence—the greater the level of emotional intelligence, the greater the productivity of that employee. A person with such competences can recognize and name his/her own emotions and those of others. Likewise, he/she can solve conflicts more easily and reduce tension.
- Coming to conclusions and taking decisions—the employee of 2020 must be independent. Work in the future shall require the skill of making difficult decisions fast.
- Orientation towards services—being at the front end with a client. An employee who is concentrated on helping others shall be wanted on the market. This refers to both working in a team, as well as with a client.
- Negotiations—conflict-free solving of problems, as well as the skill of coming to terms with various views and stances.
- Cognitive flexibility—this assumes the skill of finding and combining various ideas, notions, and data, while also being innovative. The ability to observe connections between the seemingly different aspects guarantees firms of development. Working in the future shall be to a large extent based on choosing the best out of thousands of ideas.

However, the report entitled “Future of skills. Employment in 2030”, indicates that in the upcoming years, interpersonal skills, as well as social, systemic, and cognitive competences will be in vogue. Out of the areas that shall be necessary to perform the professions of the future, there are those associated with management, science, and of course foreign languages, while also the broadly perceived innovativeness and creativity. A detailed list of competences includes the following [64]:

- Self-learning and teaching others,
- Active learning and listening,
- Cooperation,
- Art of deduction,
- Comprehensive solution to problems,
- Coordination,
- Logical and critical thinking,
- Evaluation and taking decisions,
- Management of financial resources,
- Management of human resources,
- Monitoring and evaluation of results,
- Negotiating and persuasion,
- Clear communication,

- Programming,
- Fast reactions
- Social perception,
- Evaluation of systems and processes,
- Designing technology,
- Time management
- Visualization,
- Instructing.

One of the principal challenges facing the institutions of higher school education in Europe is the transformation of its current pedagogical practices into teaching based on competences as a response from the universities to the needs of the labor market [65]. A problem has appeared on the labor market that is associated with the correlation between the expectations of the employers in the sphere of competences that graduates of universities are to hold and the actual competences the graduates take with them from the educational system at universities. Employers demand that university graduates not only have knowledge of a specialized field that is created and provided by universities, but also the so-called soft skills or competences. In multiple research projects, employers have come to the conclusion that from their perspective, university graduates do not possess the appropriately developed soft skills that are directly associated with their employment (see research by Made, Ketut, Sudhana, and Hariyanti [66]). Such skills as critical thinking, solving problems, the skill of analyzing and synthesizing information, creativity and innovativeness, cooperation and teamwork, communication, together with the skill of learning are all extraordinarily important not only for finding the first employment, but also for the professional development of the people employed [67].

Nevertheless, the principal competences acquired at university according to Spanish graduates may be divided into the following: Innovativeness, interpersonal skills, knowledge management, communication, organizational, and professional development (see: research by Conchado, Carot, and Bas [68]). The formation of professional competences and soft skills among students is becoming very significant, particularly in cross-border areas where the resources are allocated. In Europe over the past few years, there has been a rapid development of outsourcing organizations that are opening new branches in the territories of Poland, Slovakia, or Romania. The University of Economics in Bucharest conducts research on the entry of graduates into the labor market on an annual basis. The research analysis conducted there in 2018 illustrated that 83% of graduates are employed in accordance with their specialization (46%), or in similar fields (29%). Among the students attending BA degree studies, 52% of those employed declared that they succeeded in finding work during their studies, while 22% within six months of completing their studies [67]. Hence, it is crucial to implement a system of education that is based on competences, which constitutes an interesting turning point in the Spanish system of higher education. At the beginning of this decade, Bricall indicated that the Spanish universities should be more oriented towards the labor market [68].

Enhancing the level of quality of education of university graduates in the sphere of the sets of competences prepared at universities is significant in the current context of the economic development of the Carpathian Euroregion. The universities located in cross-border areas must develop both professional competences, as well as soft skills among their students, which in turn, shall increase their opportunities for employment and help in their professional development.

7. Methodology of Empirical Research

By applying these deduction theories, attempts were made up to now in a meticulous fashion to define all the significant notions that avail a broad process of the systematization of acknowledged literary sources. Likewise, both hitherto foreign and Polish research projects were identified and familiarized with in terms of the area of the stipulated competences of the graduates, as well as their innovativeness. Nevertheless, it is necessary to emphasize that the problematic issues indicated

were analyzed exclusively in a political or regional notion and there is no hitherto research on the subject matter of the Carpathian Euroregion and within the framework of its cross-border cooperation with particular consideration given to the role of university graduates in terms of shaping change in this sphere.

By availing the principles of planning scientific research by Creswell [69], the research problem was formulated for the purpose of profound analysis. The aim of the research was the identification and verification of the degree of importance of the specified types of competences:

- Communication in the native language,
- Ability to communicate in foreign languages,
- Mathematical and science competences,
- Technology competencies,
- Ability to learn,
- Social and civil competences,
- Initiative and entrepreneurship,
- Cultural awareness,
- Additional competences.

The chosen research method, namely, a questionnaire, was directed at students and graduates of business schools in the chosen universities located in the cross-border areas of the Carpathian Euroregion. The choice of the survey method decided on its distinctive features (see research by, among others, Kraemer [70]):

- The survey research facilitated a quantitative description of the specific aspects of the declared competences of the graduates in the chosen research group,
- The data required for research were collected from students and graduates, thus it is subjective,
- The research conducted in a chosen research group in the particular countries may be realized later in terms of the entire population under analysis.

The survey method also facilitates conducting research and acquiring information that would otherwise be difficult to measure with the aid of observation techniques.

In the preparation of the questionnaires that are based on the approach proposed by Creswell [69], as well as the approach of Schwarz, Tanur, and Tourangeau [71], the following principles were assumed:

- Reliability—with regard to the cohesion of the survey responses,
- Coherence of position—responses to each question shall be cohesive in various constructions,
- Validity—the measurements were to provide information that is necessary in order to achieve the research aim.
- Simultaneous validity—the possibility of the correlation of the findings with the findings of the systematic literary review and with the findings of other research projects on the subject matter for analysis.

Designing the questionnaires commenced with the establishment of the procedures for the attainment of results. By assuming the propositions of Salant and Dillman [72] as the starting point, the indicator of the responses was defined and the preferred level of accuracy of the research was stipulated. A choice was made of the so-called theoretical sample (see research by, among others, Attewell and Rule [73]), as this facilitated the specification of the entities of the desired features. Albeit that the theoretical sample is not entirely chosen randomly, the particular respondents of this sample were chosen randomly from a group of students and graduates from the qualified universities for research in order to attain the approximate effect. A significant determinant of the aforementioned decisions was also the ability to gain access to the desired research areas.

Closed questions were applied in the questionnaire. While formulating the questions in the questionnaire, the principle of using understandable formulations was applied so that the questions,

as well as all options of responses were clear to the respondent, while also excluding any alternative interpretation or incomplete sentences that by way of consequence could lead to a misinterpretation. The sequence of the questions is the result of the previously conducted literary studies and diagnoses of other research tools in order to have an impact on the type of responses acquired and to minimize any bias of the findings.

The key competences were chosen on the basis of the competence standards for lifelong learning as defined by the EU (see The European Reference Framework of Key Competences for Lifelong Learning [74], which were subsequently modified and supplemented in accordance with the analysis conducted. Each competence was subjected to analysis with the aid of the 7-point scale for the evaluation of the usefulness of the specified competences, where one point was for 'not needed', two points for not 'very useful', three points for 'somehow useful', four points for 'useful', five points for 'very useful', six points for 'extremely useful', and seven 'necessary/essential'.

The research was commenced with a pilot study (see [75]). This process facilitated the establishment of whether the respondents understood the questions and instructions, while also whether the significance of the questions is the same for all respondents. The pilot study highlighted whether the sufficient categories of answers are available and whether the respondents systemically avoid any questions.

Subsequently, the appropriate research was conducted. It was assumed that participation in the survey was voluntary, albeit potential respondents were encouraged to participate without excessive pressure or coercion.

The survey method, as indicated by the research by, among others, Kelley, Clark, Brown, and Sitzia [76] and Mathers, Fox, and Hunn [77] facilitated the following:

- Conducting a longer and more precise analysis with the aid of complicated filtering,
- Attaining a higher indicator of responses,
- Providing the possibility of building and elaborating relations,
- Providing respondents with the possibility of responding to questions in their own time.

By commencing the verification of the data acquired in the research, the following criteria for the evaluation of the quality of the findings was adopted:

- Validity—the findings relate to the assumed research area,
- Credibility—the findings were collected in accordance with the accepted standards,
- Completeness—all elements of the research were taken into account,
- Precision—the findings are of sufficient detail,
- Honesty—the research was protected against deliberate prior notice or manipulation,
- Timeliness—the research findings acquired are valid.

The accumulated survey findings were entered into the system and subjected to inductive analysis. The precision of the data was checked (checking for errors and cohesion of entries). In the case of the lack of a response in the sheet, a medium value or the response "No" was indicated, in order to maintain the magnitude of the sample. During the course of drawing conclusions however, the possibility of incomplete knowledge was taken into account, or whether someone had omitted a question, or whether someone had decided not to respond. In describing the research findings, descriptive characteristics were employed that encompassed a description of the common basic features of the data in an ordered fashion.

The deliberate integration of the various methods of accumulating data and the triangulation of the various sources of data facilitated the overcoming of weaknesses appropriate to each research project if it was to be executed independently. Likewise, this also improved the credibility of the findings as the information from the various data sources is convergent.

8. Findings and Conclusions

During the course of research, the techniques of probability sampling were availed of, which facilitates the specification of the probability that a participant shall be chosen from a population group randomly. The assumptions adopted facilitate the claim that the sample is representative for the population at hand. The procedure of selection was repeated in each of the three countries with the aim of acquiring similar samples. The research was participated in by 300 students from the final semester of business schools, as well as graduates of these courses in the age group of 23–28 years of age (100 from Poland, 100 from Slovakia, and 100 from Romania). The entire findings are stipulated in Table 4.

For the purposes of analyzing the competences in the sphere of communication in the native language, they were divided into detailed competences as follows: Active listener, ability to be influential/persuasive, as well as the ability to provide feedback.

The ability to communicate effectively, negotiation skills, good self-presentation skills, albeit the findings from the analyzed population of Romania are fundamentally lower than the findings for Poland or Slovakia. It is possible to indicate the probable cause here of a much greater national differentiation and cultural and social differentiation in Romania than in the remaining countries. This constitutes a significant barrier in terms of the processes of communication. These nations are closed within their own environments.

The second group of competences, namely, the ability to communicate in foreign languages, was divided into two sub-groups: Familiarity with the English language and familiarity with other foreign languages illustrated a similar level of competences in all the countries under analysis. This is significant in the case of knowledge transfer, not only on the local markets, yet also in cross-border ties. However, it was acknowledged that it would be worth specifying the level of competences in the future in terms of the mutual communication in the cross-border areas in the cases of the particular local dialects that are understandable for the inhabitants of these regions, which would certainly facilitate the functioning of the labor markets of the cross-border areas.

For the purposes of analyzing the skills of communicating in foreign languages, a division was made between the English language and other languages. The average significance for this category amounted to 5.1, while the most important skill was deemed to be familiarity with the English language (5.3), while subsequently other foreign languages (5.1).

Mathematical and science competences are shaped in a similar manner in Poland and in Romania, albeit in Slovakia the results are lower. In this case, the obvious cause of this is the location of the most outstanding Slovakian universities in other areas of the country that are outside of the area under analysis, namely, mostly in the region of Bratislava.

Interestingly, in a further research category the results of Polish students and graduates are the weakest, namely, technology competencies, which is the result of the lack of a sufficient level of education within the framework of the course study programs on business. Informatization and technology are seldom the subject matter of lessons.

The ability to learn was also divided into detailed competences and in this case the weakest result is in all the three countries in the case of the competence of problem solving by contrast with the ability to draw conclusions. This is a curious dependency that is worthy of more profound analysis in the future.

Social and civil competences were evaluated from the viewpoint of six sub-factors as follows: Human resource management, the ability to build relationships with customers, the ability to be a team player, interpersonal skills, ethics, and empathy. This research category was of particular importance for the identification of the possibilities of knowledge transfer from the universities to the business markets. The highest marks were acquired in the case of the competence of ethics in all three countries, which is a result of the broadly ranging activities in terms of propagating and teaching CSR and the guidelines of sustainable development. In this case, Poland is the most highly ranked of all the categories in this area of competences.

Table 4. Research results.

Competencies According to EU Standards	Detailed Competencies Indicated in Research	Poland	Slovakia	Romania	Average
Communication in the native language	Active listener	5.1	5.1	4.6	5.0
	Ability to be influential/persuasive	5.0	5.0	4.9	5.0
	Ability to provide feedback	5.3	5.4	4.9	5.2
	Ability to communicate effectively	5.6	5.5	5.1	5.4
	Negotiation skills	5.1	5.1	5.3	5.2
	Good self-presentation skills	5.2	4.9	4.6	4.9
Ability to communicate in foreign languages	English language	5.4	5.4	5.0	5.2
	Other foreign languages	5.3	5.4	5.4	5.3
Mathematical and scientific competencies	Analytical skills	5.0	4.6	5.3	4.9
	Ability to identify key information within information overload	5.4	5.0	5.0	5.2
	Numeracy skills	5.0	5.4	5.1	5.2
Technology competencies	Ability to use technology/computer/network, MS Office	5.1	5.3	5.3	5.2
Ability to learn	Quick learner	5.2	5.0	5.0	5.1
	Problem solving	4.8	5.1	4.7	4.9
	Ability to draw conclusions	5.5	5.3	4.9	5.3
	Quick decision maker	5.1	5.0	4.8	5.0
	Clear career path	5.3	5.0	4.9	5.1
	Participation in courses and trainings (CPD)	4.8	5.0	5.2	5.0
Social and civil competences	Human resource management	4.7	4.7	4.6	4.7
	Ability to build relationships with customers	4.9	5.0	4.9	4.9
	Ability to be team player	4.8	5.1	4.9	4.9
	Interpersonal skills	4.9	4.8	4.9	4.9
	Ethics	5.2	4.9	5.3	5.1
	Empathy	4.6	4.8	5.1	4.8

Table 4. Cont.

Competencies According to EU Standards	Detailed Competencies Indicated in Research	Poland	Slovakia	Romania	Average
Initiative and entrepreneurship	Ability to organize work and effective time management	4.9	5.0	4.8	4.9
	Flexibility and adaptability	4.9	4.7	5.3	5.0
	Entrepreneurship	5.1	5.1	5.1	5.1
Cultural awareness	Ability to work with people from different backgrounds, countries, cultures	5.3	5.0	5.2	5.2
Additional competences	Industry expertise and directional expertise adequate to the current needs of enterprises	5.2	4.8	5.1	5.1
	Certificates, awards confirming completion of studies, programs, specific skills	4.8	5.2	5.1	5.1
	Experience	5.2	5.8	5.3	5.5

Source: Self-analysis.

Another significant group of competences in terms of the identification of the innovative dependencies and knowledge transfer was the group of competences of initiative and entrepreneurship (the ability to organize work and effective time management, flexibility and adaptability, entrepreneurship). The Polish research findings of all the categories of competences were assessed similarly, although in the case of Slovakia and Romania they were ranked. In Slovakia, the highest result was for entrepreneurship, whereas the lowest result was for flexibility and adaptability. In Romania, it is quite the opposite situation as flexibility and adaptability are the most desirable competences.

Cultural awareness was defined as the skill of working with people from different environments, countries, cultures, and in this case, it is most highly ranked in Poland, followed by Romania and finally Slovakia. The cause of this result is the previously rooted cultural and social differentiation, while additionally in the Slovakian part of the cross-border region there is a higher indicator of poverty than in both of the remaining countries.

The final category was that of the additional competences. The weakest result in Poland was noted in terms of certificates, namely, awards confirming the completion of studies, programs, specific skills, whereas in Slovakia this was noted in terms of industry expertise and directional expertise adequate to the current needs of enterprises. The research findings in Romania are comparable with all the areas of the detailed competences.

In the entire research conducted in Poland, the most significant competences of students and graduates was deemed to be the ability to communicate effectively, whereas in Slovakia, it was the experience and in Romania, this was the familiarity with a multitude of foreign languages, apart from the English language.

Nowadays, universities are facing the challenge of planning and implementing a program of teaching that shall enable students to develop the competences that would in turn facilitate the knowledge transfer from the university to business, while simultaneously building a stream of innovativeness that is particularly important in a regional sense.

The research conducted reveals that there are no clearly defined paths to ranking the essential competences that are geared towards innovativeness, thus the decision-makers at universities in the Carpathian Euroregion must consider in what way and what activities they may include in terms of developing competences. The prognosis [78] in the perspective of 2030 indicates that the employees of lower qualifications shall be the most endangered, while furthermore, shall have fewer public funds available for training and enhancement of skills due to the budgetary restrictions. It is essential to develop certain skills in the sphere of modern and innovative firms. In the case of the highly qualified graduates, there shall be greater needs and attractive opportunities. More workplaces shall emerge on the basis of projects, in the case of which universities shall have to assist in terms of developing the specified skills beyond the basic program. The broad integration of the cost-effective ICT technologies also signifies that some existing professions shall disappear, and new ones shall emerge. This provides the opportunity of further research on the subject of the development of competences.

9. Discussion

Analysis of the programs of education in the opinions of the working students, graduates, and employers may have a beneficial impact on the profile and quality of their education, as well as the fate of the graduates in the countries forming the Carpathian Euroregion that are encompassed within this research, while also other countries that are interested in its findings.

The analysis, distribution, and the practical use of the research findings should have a positive impact on the fate of the graduates of the study courses of business administration/management, while also the acquisition and maintenance of employment that they receive, the effectiveness of the enterprises, and social benefits. It should also serve the transfer and adaptation of good practices from individual countries and regions to other countries, both European and non-European.

A complete and planned analysis by the authors of the experience of several countries in the sphere of the preparation of final year students at university shall facilitate the illustration of the

most useful and practical tool for the improvement of the process of adapting young people to the labor market.

The proposed research and the findings accruing from it shall facilitate the specification of the qualification requirements of final year students with regard to future employers, which would be very good material for employers in terms of what way to create new workplaces and how to conduct recruitment and adaptation processes for the young.

Unfortunately, a significant restriction in the research was the difficulty with acquiring information on the subject of the multitude of processes of knowledge transfer at universities, which shall probably hinder the planning of courses geared towards enhancing the effectiveness of the universities, business practices, and the entire Carpathian Euroregion in the future.

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