

# THE ROLE OF HUMAN CAPITAL IN AN INNOVATIVE ENTERPRISE IN POLAND

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## INTRODUCTION

Modern enterprises have to be competitive, to introduce new technologies and new products and to use available knowledge and to use available knowledge and resources to achieve economic results. The key to the realization of this goal is innovation [7]. The innovative potential of an enterprise is the result of combining the internal innovative potential with external sources of innovation. The internal innovative potential of an enterprise is composed of human capital (knowledge and experience, skills and qualifications as well as the way of managing the resources which are available), research and development works conducted and technology (modern machines, equipment, software). The external sources of innovation are, for example, competition, research and development units and availability of external sources of financing. Enterprises which aim at their own development have to work on the development of inner innovative potential, in which human capital plays a very important role. Proper using and managing human capital contributes to increasing the competitiveness of the enterprise as well as to enhancing its innovative potential.

The purpose of this work is to analyze the role of human capital in an innovative enterprise. Literature studies, Eurostat statistical data, and the results of studies conducted in Poland have been used in this work.

## 1 INNOVATIVE POTENTIAL OF AN ENTERPRISE AND ITS ELEMENTS

Innovativeness is a very broad term of interdisciplinary character. According to J.A. Schumpeter, the meaning of the term *innovations* encompasses all kinds of changes of technical, organizational and economic nature [9]. P. Drucker also states that innovations tend to have economic or social

dimensions, not only technical. He describes innovations as “special tool of entrepreneurs by means of which they turn a change into the opportunity of starting a new economic activity or providing new services” [3]. Innovativeness is the key factor of competitiveness of an enterprise. Introducing new or significantly improved products, processes and methods is crucial for the increase of efficiency and the creation of new work places. Innovativeness is thus an element, which is necessary for functioning in extremely competitive economy nowadays. [11].

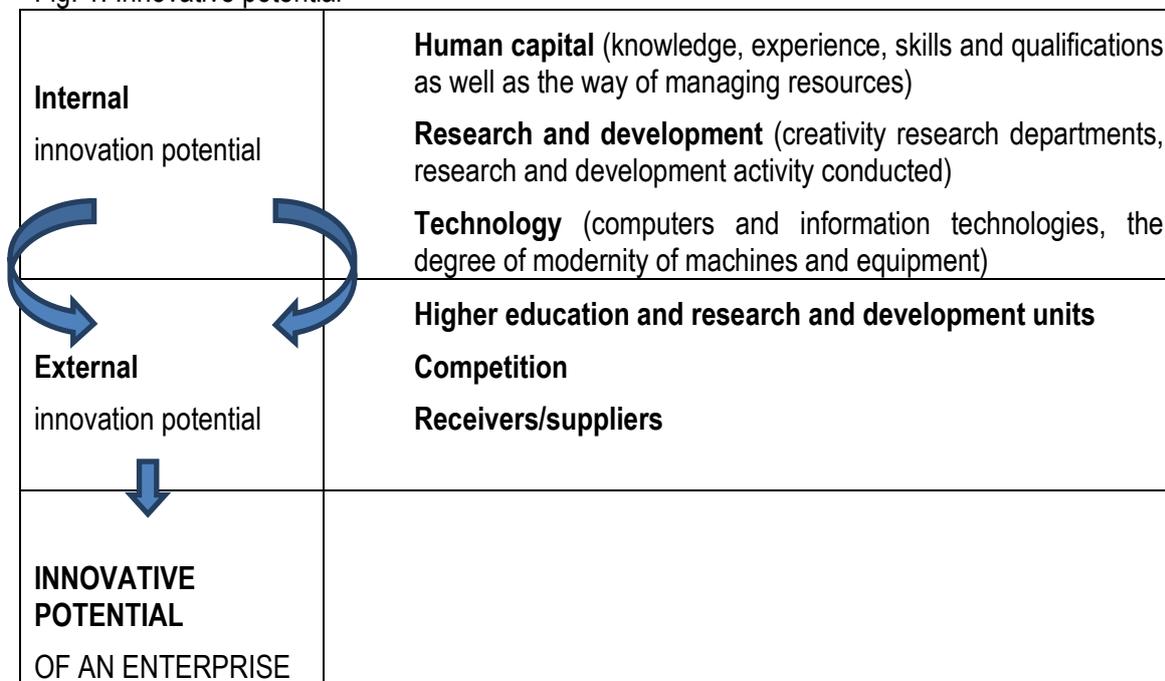
An innovative enterprise is the one, which introduced at least one innovation in the period analyzed. If it happens that in the researched period the company will be conducting innovation activity, but it will not implement innovation, irrespective of the fact all activities connected with the preparation or implementation of innovation (including implementations planned for the future) will be counted as innovation activities. The activities aiming at introducing innovations are connected with possessing adequate resources, especially financial ones. However, in literature one can observe the increasing tendency to draw attention to special qualitative features, i.e. so-called soft factors of the increase of innovativeness, which are particularly important in modern companies. Such characteristics comprise knowledge, team work and contacts with workers and clients. These elements constitute human and intellectual capital of an enterprise [2].

To conduct innovative activity, enterprises use their potential defined as possibilities, innovation abilities to create, introduce and manage innovations. One of the elements of innovation potential is the internal resources of the company, the other one is the possibilities (abilities, competences) of using the resources. L. Białoń defines innovation potential as a

complex of mutually related elements of resources, which as a results of the work conducted will be transformed into a new state – thanks to the possibilities of given means and forces used to create these values. [2] A.

Žyliński describes innovation potential of an enterprise as a result of relation of internal innovation potential with external sources of innovation. [14]

Fig. 1. Innovative potential



Source: Based on [14]

Human capital is understood as "the knowledge, skills, and capabilities of individuals that represent some economic value for organizations". It also encompasses so-called know-how and the ability to efficiently execute tasks in various, even unusual situations, as well as corporate culture, values and human relations. According to other definitions, human capital is constituted by employees including the company's top management. Domański defines "human capital" as the resources of knowledge, skills, health and vital energy contained in a society. He also draws attention to the important fact that even though it is a resource conditioned by the genetic traits of a given population once and for all, it is still possible to enhance it through investments called investments in the human being [3]. Sadowski says that "it is primarily human, social and cultural capital that is accumulated in human resources [12]. Human capital involves

knowledge (education), professional skills, and health together with the capabilities of using it, the knowledge of foreign languages, computer skills, the readiness to make new contacts and thus flexibility with regard to different cultures and lifestyles. Human capital is the skills of individual people, their accumulated knowledge, and ability to cooperate and undertake joint enterprises. Some authors define human capital as fully embodied in workers. [13]

## 2 CHARACTERISATION OF INNOVATIVE ENTERPRISES IN POLAND

In 2011 in Poland more than 3,869mln enterprises operated, among which 27.7% were innovative units. In comparison with other EU countries this ratio is one of the lowest. On average, in the EU 52% enterprises are of innovative character. In the period 2009-2011 the biggest ratio of enterprises introduced

process innovation (21.4%). A significant percentage of companies introduced also product innovations (17.5%) and organizational ones (17.4%), while a slightly smaller number decided to introduce marketing innovations (15.7%) [10]. Process innovations introduced by industrial companies in the period 2009-2011 most often concerned new or significantly improved methods of production of goods and services, and in the services sector – new or substantially improved methods (systems) supporting processes in the company [10], such as operational systems connected with purchase, accountancy, calculation systems or maintenance systems. Product innovations and process ones are mutually related, therefore, in practice it often turns out that the product introduction is impossible without the introduction of the process innovation or vice versa. That is why part of enterprises decide to

introduce both kinds of innovations. In Poland in the period 2009-2011 the percentage of such companies amounted to 7.5%, with 3.7% in the sector of services.

## 2.1 STRUCTURE OF INNOVATION EXPEDITURES IN POLISH ENTERPRISES

Innovation expenditures of enterprises are one of the most important indexes, which are used to evaluate their level of innovativeness [6]. Innovation expenditures are measured as expenditures on innovation activities conducted over the last three years, which are covered by companies in a given year. It should be added that in Poland research studies on innovativeness are conducted in two groups: industrial companies and enterprises operating in the service sector.

Tab. 1. Expenditures on innovation activity by sectors and by number of employees in 2011

Expenditures	Industrial enterprises		Service sector	
	In mln PLN	(%)	In mln PLN	(%)
<b>TOTAL</b>	<b>20821,1</b>	<b>100</b>	<b>10979,1</b>	<b>100</b>
<b>by sectors:</b>				
<b>public</b>	4247,0	20	2260,4	20
<b>private</b>	16574,1	80	8718,7	80
<b>Enterprises with the number of persons employed:</b>				
<b>TOTAL</b>	<b>20821,1</b>	<b>100</b>	<b>10979,1</b>	<b>100</b>
<b>10-49 person</b>	1444,6	7	661,2	6
<b>50-249 person</b>	4272,6	21	805,4	7
<b>250 and more</b>	15103,9	72	9512,5	87

Source: Based on [10, p.55]

In 2011 innovation expenditures of Polish industrial enterprises amounted to 20800mln PLN (Tab.1), while for service sector enterprises they were lower by half and amounted to 11000mln PLN. The vast majority of expenditures on innovation activities was covered by private enterprises both among industrial and service companies. Expenditures

on innovation activities constituted about 80% of all investment expenditures.

On analyzing the structure of innovation expenditures taking into consideration the size of the enterprise measured by the number of employees, it can be concluded that the biggest expenditures were covered by big enterprises (250 and more workers) both in industrial and

service companies (Tab. 1). The expenditures of the firms belonging to this size class constituted 73% of all innovation expenditures of industrial companies and 87% of those covered by firms from the service sector.

In 2011 industrial enterprises spent 15000 mln PLN on investments in fixed assets. In

comparison with the previous year the value is lower by 10.4%. 2600 mln PLN was invested in research and development activities. However, the value was also reduced by approximately 20% in comparison with the previous year (Tab.2).

Tab. 2. Expenditures on innovation activity by type of innovation activity

Years	Total	Of which					
		research and development activity	acquisition of external knowledge	acquisition of software	capital expenditures on fixed assets	staff training connected with innovation activity	marketing for new and significantly improved products
In mln PLN							
<b>Industrial enterprises</b>							
2007	19804,6	1602,8	324,2	340,9	16506,9	63,7	577,2
2008	23686,1	1930,0	261,5	354,2	20065,7	201,7	580,1
2009	21405,5	2173,1	267,8	356,6	17971,7	44,6	345,9
2010	22379,0	3272,8	910,6	451,8	16736,7	88,3	440,3
2011	19376,5	2617,2	257,8	428,6	15003,2	64,8	439,4
<b>Service sector</b>							
2008	9794,6	556,6	174,2	1103,3	7329,4	56,1	266,3
2009	7624,3	690,2	586,4	1162,8	4429,0	54,1	481,9
2010	9921,1	1270,5	787,5	1482,1	5530,1	71,5	453,5
2011	10317,9	1355,3	#	1484,0	5658,5	#	462,1

Source: Based on [6, p.132]

Similarly to industrial enterprises, companies from the services sector also had the highest expenditure on fixed assets. In 2011 over 5600 mln PLN was spent on them, which means that the expenditure was higher by 2.3% than in 2010. The second highest expenditure in services sector companies was the purchase of software, the value of which amounted to 1500mln PLN.

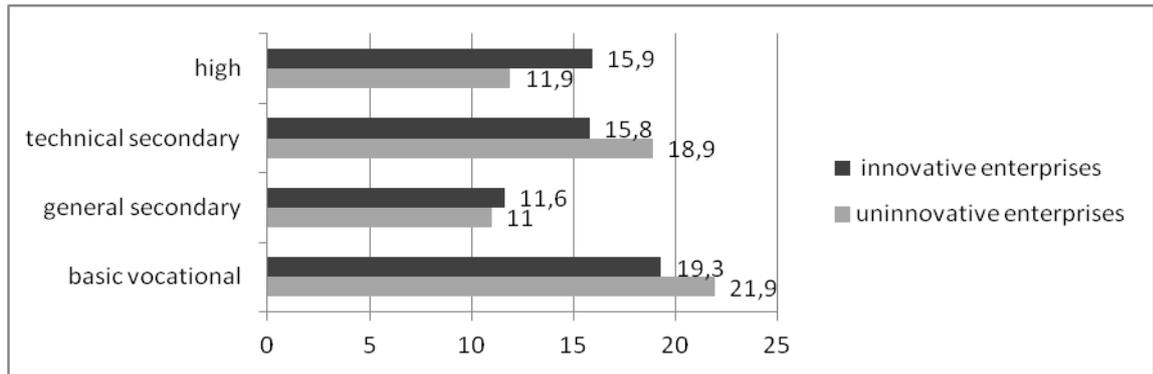
Both services sector companies and the industrial ones had the lowest expenditures on staff training connected with innovation activities. This fact shows the weakness of Poland in the field of managing of innovative enterprises. Trainings are vital for employees' full understanding of the mission and vision of an innovative enterprise. Thanks to acquiring this knowledge workers are able to create and

realize a strategy, which ensures efficient operation of the company.

### 3 THE ROLE OF HUMAN CAPITAL IN AN INNOVATIVE ENTERPRISES IN RESEARCH STUDIES

Research studies conducted by the Polish Agency for Enterprise Development among managing staff showed that the quality of human capital (employees' education) is important for innovativeness of an enterprise. Enterprises with a bigger number of university graduates are more inclined to introduce innovations (Fig.2).

Fig 2. Innovativeness of companies according to the level of education of regular employees



Source: Based on [9, p.117]

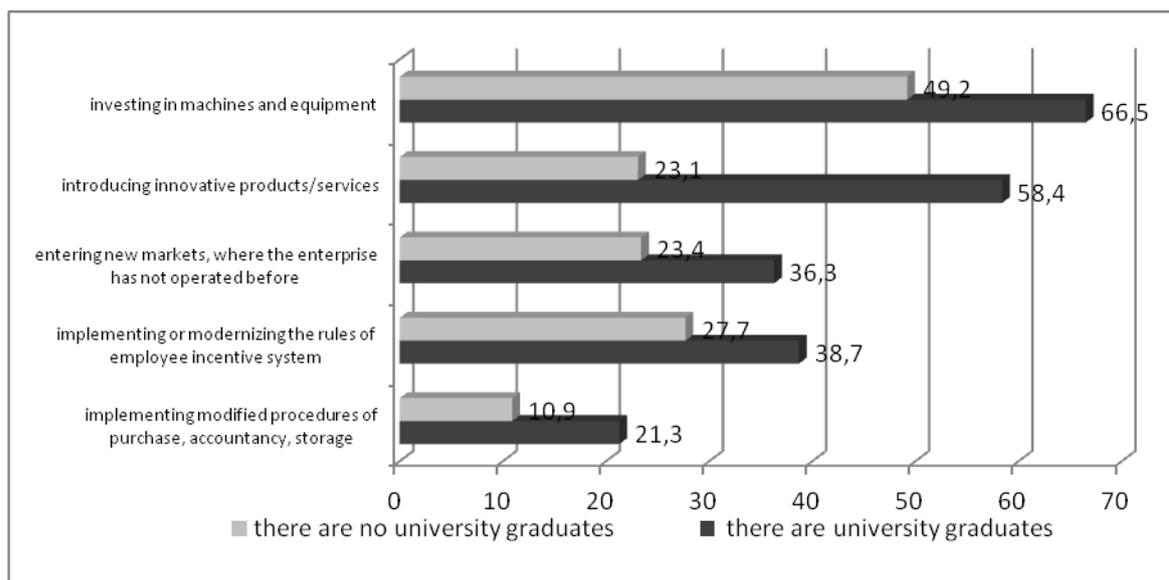
As results from Figure 2 enterprises with a bigger share of regular workers who are university graduates are more inclined to introduce innovations.

In big companies it is the education of managing staff which determines the innovativeness of the enterprise. Figure 3 shows that companies which employ university graduates as managing staff are more willing to introduce innovations (Fig.3).

From the research studies conducted by the Polish Agency for Enterprise Development in a

group of 600 managers in Polish enterprises it results that the enterprises with a bigger percentage of managers with higher education are more inclined to introduce innovations. On analyzing the kinds of the introduced innovations, it can be concluded that the companies in which the number of managers with higher education was the highest invest in machines and equipment, introduce innovative products and services as well as implement new procedures of purchase, accountancy and storage.

Fig. 3. Kinds of innovations introduced and level of managerial staff (in %)

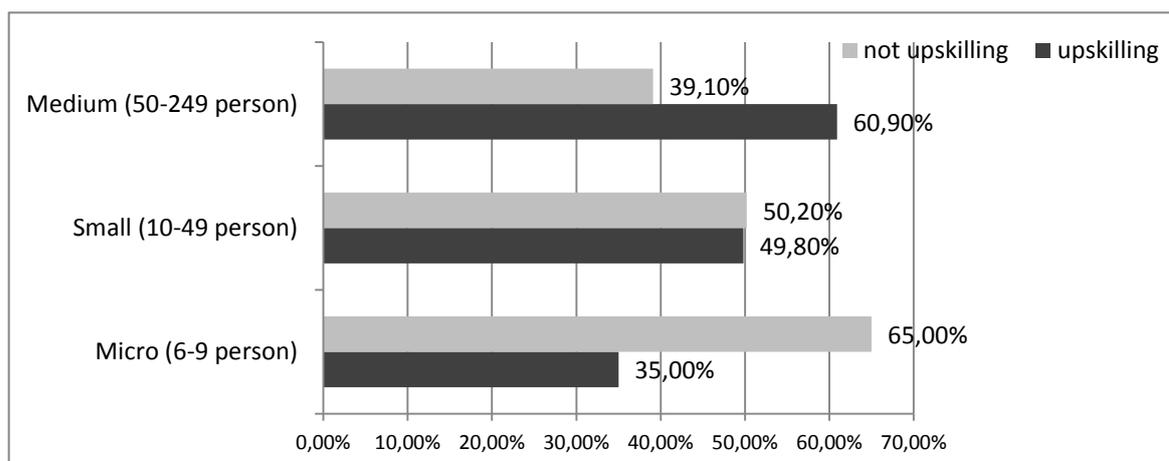


Source: Based on [9, p. 118]

In Poland 99% enterprises are SMEs, in which about 68% of the employed work. The analysis of innovativeness of Polish enterprises showed that the highest innovation expenditures are covered by enterprises employing more than 250 workers (73% from the enterprises sector and 87% from the services sector). Besides having appropriate human capital, big enterprises have also financial means, which they can spend on investments, conducting

their own development research or on purchase of knowledge from external sources. Very small companies (up to 9 workers), which constitute 96% of all SMEs in Poland, are least effective in developing their workers' qualifications (Fig 4.). Only 35% enterprises employing up to 9 workers improve employees' qualifications, while 50% small-sized enterprises (10-49 employees) and 60% medium-sized companies do so.

Fig. 4. Upskilling and not upskilling entities according to the enterprise size



Source: Based on [9 p.134]

The percentage of persons who upskill grows with the increase of the enterprise size. The reason for the low training activity of SMEs is mostly the limited amount of financial resources.

The interviews conducted among managerial staff from the IT sector in Poland lead to the conclusion that human capital and financial capital are the key resources of a company [11]. Managers emphasize that the key to success of every company are human resources. That is why investments are not so important from the point of view of current operational activity, but they are crucial from the perspective of development. Financial resources are classified on a high position because of the following factors:

- it is the element directly enabling the development of human capital through the investment in it,

- thanks to the availability of sufficient amount of financial capital enterprises can afford to effectively search for proper human resources (by means of their own tools or through head hunting agencies),

- financial resources at an appropriate level facilitate maintaining liquidity, especially for new enterprises, which find it difficult to obtain external sources of financing,

- availability of financial resources allows for the implementation of new projects in an enterprise

The results of the research studies allow for distinguishing internal and external factors of improving innovativeness (Tab. 3)

Tab. 3. Internal and external conditions of improving innovativeness in an enterprise

Internal	External
<ul style="list-style-type: none"> <li>• <b>Financial factor</b></li> <li>• <b>Human capital of adequate quality</b></li> <li>• Open internal innovation projects</li> <li>• Openness to change</li> <li>• Adjusting to changing conditions in the company</li> </ul>	<ul style="list-style-type: none"> <li>• Competitiveness – its behaviours and reactions to market trends,</li> <li>• Clients – their demands, expectations, changes in their attitudes</li> <li>• Legal regulations – supporting entrepreneurial and innovative activities</li> <li>• Political and economic conditions of an enterprise – available sources of financing</li> </ul>

Source: Based on [10, p.35-36]

As results from the above presentation, enhancing the innovation potential depends greatly on human and financial resources.

As regards the findings on skills and creativity, Table 4 presents the successful methods for stimulating creativity in innovative enterprises in selected countries: Luxemburg, The Czech Republic and Poland. The companies were chosen because they represent three groups: countries which have the highest ratio of innovation enterprises (Luxemburg), those with a middle ratio (The Czech Republic) and the ones whose is the lowest (Poland). More than a

68% innovative enterprises of total enterprises is in Luxemburg. A lot of countries are consider brainstorming sessions to be the most beneficial method. The highest shares of enterprises that strongly support this method is Luxemburg (76.9 %). Multidisciplinary or cross-functional work in teams are, according to enterprises, the second most successful method. Luxemburg have also the highest shares of enterprises that consider this method highly fruitful. Training on how to develop new ideas or creativity is overall a little less successful than the first two.

Tab. 4. Creativity and skills available in innovative enterprises

Country	Brainstorming session	Financial incentives for employee to develop new ideas	Job rotation of staff	Multidisciplinary or cross-functional work teams	Non-financial incentives for employees	Training employees on how to develop new ideas or creativity
Luxemburg (68% innovative enterprises of total enterprises)	72,2	22,2	35,4	68,4	32,4	46,1
Czech Republic (51,7% innovative enterprises of total enterprises)	31,2	31,0	4,7	18,3	20,7	23,2
Poland (29,8% innovative enterprises of total enterprises)	31,8	26,6	15,1	18,4	15,2	21,2

Source: Based on [5]

The highest shares of innovative enterprises that regard this method as successful are observed also in Luxemburg. Methods related to job rotation of staff, financial incentives and non-financial incentives for employees to develop new ideas are relatively less endorsed and supported by innovative enterprises. Brainstorming session and financial incentives for employee to develop new ideas are the most beneficial method in Poland and the Czech Republic. In the Czech Republic non-financial incentives for employees are more popular than in Poland.

## CONCLUSION

The research studies conducted among Polish enterprises confirmed that human capital plays a very important role in innovativeness of an enterprise. However, appropriate financial capital is also necessary. Innovativeness of enterprises increases with their size. Big companies, employing above 250 workers, have the highest expenditure on innovations.

The majority of them are industrial enterprises. From the studies it results that innovative companies in Poland employ workers with higher education (both regular employees and managers) and allocate resources for employees' development. Enterprises from the SME sector, the ratio of which is the biggest in Poland, notice the need for development and workers' education, but current financial problems, such as e.g. lack of liquidity, lack of financial surplus and difficulties in obtaining external financing, result in low expenditures. Employees' education increases with the growth and development of the company, but other factors impede innovativeness.

The Eurostat research studies show that enterprises try to stimulate their workers' innovation activities in various ways. For instance, in Luxemburg, where the ratio of innovation enterprises is very high, they most often organize brainstorming sessions and multidisciplinary or cross-functional work teams, while in Poland or Czech financial incentives for employees to develop new ideas are as popular as brainstorming session.

On the basis of the analysis of research conducted in Polish enterprises one can distinguish three groups of limitations in the influence of human capital on innovativeness of companies. The first group is hard limitations, such as lack of financial means for investments in human capital, short-term results orientation as well as the lack of investments in the development of other resources of the company. The second group consists of so-called soft limitations, e.g. not enough time for planning the innovation and project strategy, lack of time for testing and working on own ideas, lack of mutual trust. The last group of limitations includes external limitations, such as unfavorable economic situation, lack of dynamics on the market, on which the enterprise operates and high employer costs. To sum up, it can be concluded that innovativeness relies heavily on the inner potential of an enterprise, especially employees and financial resources, as well as proper policy supporting innovativeness.

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**Abstract:** In a knowledge-based economy, economic development does not depend on several economic sectors but on all sectors that must intensively use knowledge in processes of production and rendering of services. The purpose of this work is to analyze the role of human capital in innovative enterprises. The research studies conducted in Polish enterprises confirmed that human capital plays a very important role in innovativeness of an enterprise. However, appropriate financial capital is also necessary. From the studies it results that innovative companies in Poland employ workers with higher education (both regular employees and managers) and allocate resources for employees' development. The Eurostat research studies show that enterprises try to stimulate their workers' innovation activities in various ways. For instance, in Luxemburg, where the ratio of innovation enterprises is very high, they most often organize brainstorming sessions and multidisciplinary or cross-functional work teams, while in Poland or Czech financial incentives for employees to develop new ideas are as popular as brainstorming sessions.

**Key words:** Human capital, education, managerial staff, innovative potential.

**JEL Classification:** L21