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The Development of the Innovative Potential in the Academic Environment of the Republic of Moldova - a Wish or a Necessity?

Alina SUSLENCO[1]*

Abstract

In this paper, we made a theoretical and applied insight regarding the concept of innovative potential, creativity, and, we also tried to explain the need to develop the creativity in universities of the Republic of Moldova. Therefore, in order to be competitive, universities need to develop and create ideas, innovative products by capitalizing teachers' and students' potential towards the emergence of new inventions, innovative products. The university environment is characterized by creation of a favourable atmosphere for innovation. Nowadays, the universities are in fierce competition, and must demonstrate competence, exceptional abilities and an impressive capacity to capitalize the innovative potential. Only by assuming these values, universities will become real vectors of knowledge and will walk, with firm steps, on the path of sustainable competitiveness.
The present paper is focused on the use the following methods: analysis, synthesis, induction, deduction, scientific abstraction. In conclusion, we can mention that the university environment must capitalize the academics' innovative potential. It must also capitalize the students' potential in order to be competitive and achieve a high students' employability in the labour market by forming special skills and abilities.

Keywords: creativity, creative potential, innovative potential, university, students.

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1. Introduction

Working in an environment that is characterized by a fierce competition, both, in business and in higher education, businesses and higher education institutions need to take remedial and relevant actions in order to meet the demands of the market. Making an analysis of the academic environment in the Republic of Moldova, it should be noted that teachers, academics and students need to continually develop their innovative potential.

In order to answer the established questions and to make the research operational, we made use of the following research methods: analysis, synthesis, induction, deduction, scientific abstraction, scientific documentation. Methods such as analysis and synthesis have been used to research the specialized literature in the field of innovations, of the laws in the domain, and to determine what is the innovation and its characteristic aspects. Likewise, induction and deduction have been used, in this work, in order to explore the innovative potential and to establish its role within the higher education. In addition to these methods, scientific documentation has also been used to investigate the position of Moldova in the world ranking of innovations. All these methods have helped us to investigate the analysed issue and to find the necessary answers to the previously set questions.

2. Theoretical Background

The innovation activity is insufficiently supported by current legal and regulatory framework. The main piece of legislation governing the innovation process is the Code on Science and Innovation, adopted by the Republic of Moldova Law no.259-XV of 15 July 2004.

Innovation activity is a complex one involving more subjects with an innovative culture, working in an innovative environment, absorbing innovative values and cultivating a desire to innovate. In this context, in order to ensure the sustainability of the university environment in the Republic of Moldova, we need to clarify the subjects that contribute to innovation, ways of creating and cataloguing the innovation.

The Code on Science and Innovation regulates the legal relations related to: development and promotion of State policy in the field of science and innovation; scientific research, innovation and technology transfer activity; scientific and technological information; accreditation of organizations in the field of science and innovation; accreditation of

scientific and scientific-didactic high qualification staff; protection of intellectual property; the legal status of topics in science and innovation [6].

The Code on Science and Innovation defines the term *Technology Transfer* and establishes that the Agency for Innovation and Technology Transfer (AITT) is the responsible institution for realization of state policy in the field of innovation and technology transfer. But the modern concept of innovation is only partially reflected in the Code. The concept of innovation has been defined in the Code as "the application of the final result, new or improved, of the activity from the scientific research domain and the technology transfer realized in the form of knowledge, product, service, competitive process, new or improved, used in practice and / or marketed" [6.]

This definition leaves out, from the legal framework, the types of innovations that do not result from the scientific research process, but are generated, at the level of a firm, subsequent to incremental, organizational, non-technological, innovations, etc. At the same time, in order to be able to benefit from public financial resources allocated to the sphere of science and innovation, the innovative entities must be accredited, assuming the process by which the National Council for Accreditation and Attestation officially recognizes the competence of the organization in science and innovation sphere and its staff to carry out their specific profile activities, according to the assessment norms and accreditation criteria [6].

The complexity of innovation phenomenon has led to a multitude of approaches and definitions of the concepts of "innovation" [7]:

For the first time the mechanisms and factors of the innovation process were approached in 1942 by the American economist of Austrian origin Joseph Schumpeter, who is considered the founder of the theory of innovation entrepreneurship, in modern understanding. Innovation is regarded from the perspective of the market and the industry as a "creative destruction", whereby the balance and structure of previous market are crushed to make way for a successful innovatory, mentioning that entrepreneurship and the possibility of obtaining temporary super profits can stimulate the introduction of new products on the market or can reduce the production costs.

Schumpeter includes in innovation the following:

− creating a new product;
− the introduction of new methods of manufacture;
− a new market entry (or the creation of a new market);
− a new organization of the company [7].

Innovation, according to the European Commission Communication COM (1995) 688 "Innovation Green Book" lies in:

− Renewal and widening of the range of products, services and associated markets;

− establishing new methods of production, supply and distribution;

− Introduction of changes in management, work organization, working conditions and staff training conditions [2].

A definition, that is internationally recognized, can be found in Oslo Manual (3) which defines innovation as the implementation of:

− a product (good or service);

− a process;

− a marketing method;

− an organizational management method [3].

Therefore, the given Manual addresses four types of innovations:

- product innovations;
- processes innovations;
- organizational innovations;
- marketing innovations [3].

This definition is not limited to technological innovation or research conducted by an organization or a company. Correspondingly, the narrower meaning it may be related to product innovation and technology services definition. The minimum requirement of an innovation is that the product, process, method of marketing and organizational method to be new (or significantly improved) in the practice of this company. In this category fall both innovative products that the company itself has created, and those taken from other companies or organizations.

A common feature of innovation provided by the Manual [3] is that it must be implemented (applied). A new or improved product is considered implemented when it is placed on the market. New production processes, new marketing or organizational methods shall be deemed implemented when they become actually used by the firm.

Innovation constitutes the core of the Europe 2020 Strategy agreed by the State Members within the European Council in June 2010 and which supports smart and sustainable growth, favourable for inclusion framed in this strategy [1].

Oslo Manual [3] points out that innovation activity represents all scientific, technological, organizational, and financial and trade activities, resulting in the effective implementation (application) of innovation or designed for this purpose. Some innovation activities are themselves innovative; others do not have this property, but are also necessary for innovation. Innovation activities also include research and development, which are not directly related to the implementation of certain innovations.

Art. 22 of the Code of Science and Innovation reflects the innovation activity in tandem with technology transfer, as a single process: Innovation and technology transfer activity - the process of transforming scientific research results, of practical elaborations and/or other scientific and technical accomplished achievements (as well as of scientific research and elaborations related to them) in new scientific knowledge, in products, services, processes, new or improved, which correspond to practical needs and market requirements and which undergo the process of technology transfer and marketing [3].

At the same time, Art. 21 of the Code defines in great detail the technology transfer: Technology transfer – the introduction into the economic circuit of technologies and specific machines, equipment and facilities, hybrids, varieties, types, strains, products resulting from research or acquired, in order to increase the efficiency and the quality of some products, services, processes or, in order to obtain others, which are requested on the market or by means of which an innovative behaviour is adopted, including the activity of information dissemination, explanation, knowledge transfer, consultancy, realizing the transition of an idea or technologies from the author to the recipient.

The phenomenon of innovation is deeply systemic, multifactorial and more complex and diverse than considered until recently. It is determined by the entire socio-economic setting and its approach requires a wide horizontal vision. Particularly relevant, in this regard, is the "Global Innovation Index" report, which uses 84 different indicators for a comparative assessment of 143 countries on the basis of their innovation capabilities. Therefore, the elements of the national economy that provide innovative activities include five basic pillars (inputs), Figure 1, which refers to:

− institutional environment (including political, regulatory and business environment);

− human capital and research (general education, higher education, research institutes);

− infrastructure (ICT, general infrastructure, environmental sustainability);

− the level of market complexity (credits, investments, trade and competition);

− the level of companies' complexity (employees' knowledge, innovation connections, knowledge absorption),

− and the results of innovative activities within the economy are grouped into two pillars (outputs):

− results in terms of knowledge and technology (knowledge creation, knowledge impact and diffusion of knowledge);

− creative results (intangible assets, creative products and services, online creativity) [7].

3. Argument of the paper

In the context of the above-mentioned, there is a need to explain and analyse what innovation is and who are the subjects responsible for innovation management within Moldovan higher education institutions. Similarly, what is the position of Moldova in the world ranking in the generation of innovations needs to be analysed. These questions will be dealt with in this paper and we will try to find the relevant answers to them by studying the specialized literature.

Based on the above-mentioned, we must remark that in the Republic of Moldova the legal base is well founded so that according to the Code of Science and Innovation, the defining aspects of innovation and the process of innovation generation are well illustrated. However, there are still deficiencies in the application of these legal provisions in the practice of organizations, higher education institutions.

If we are to analyse the practical aspects of applying the legal provisions, capitalizing on the opportunities offered, we observe that the legal provisions are applied at a little extent and the opportunities for generating innovations are insufficiently exploited within the Moldovan enterprises.

If we analyse the application of development opportunities in higher education institutions, then we must remark the fact that universities in Moldova must be the main artisans of generating innovations and their patenting, because once an innovative culture reigns in the institutions, when the atmosphere is suited to absorbing and generating new ideas, these institutions should be remarked by persistency and generation of innovations.

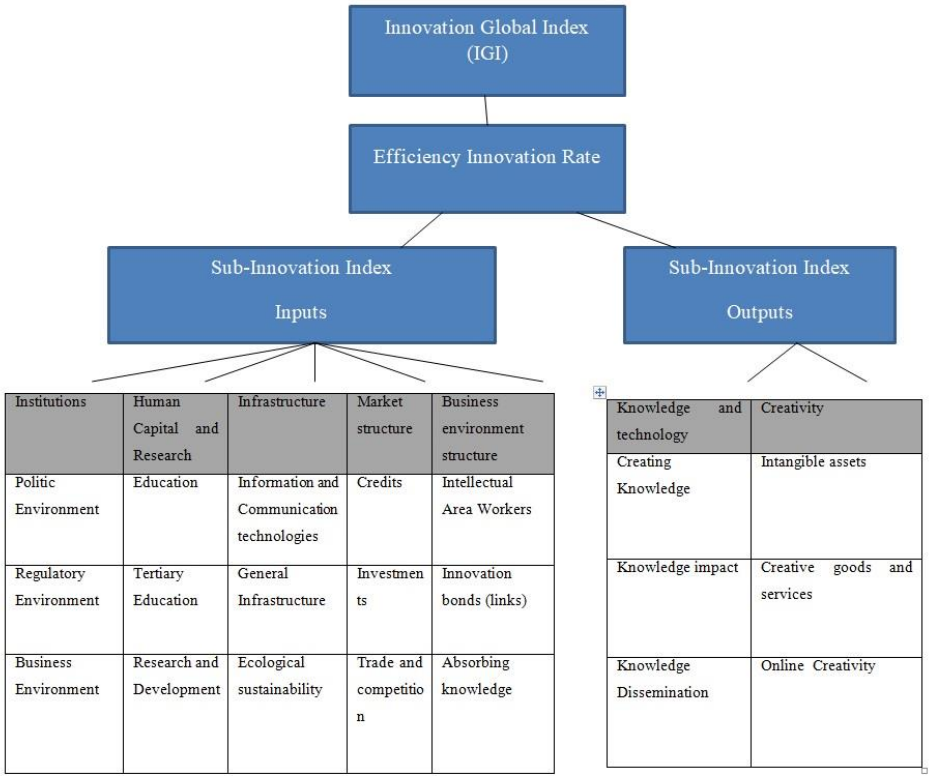
However, practice shows that Moldovan higher education institutions do not capitalize on all opportunities of generating innovations. It seems that these institutions are not stimulated to generate new ideas and perhaps are not prepared in terms of institutional innovation potential. Although there is an innovative potential of teachers, researchers in higher education institutions, however, the basic potential, i.e. the physical endowment of the laboratories within the institutions, is insufficiently developed.

If we critically analyse the legislative aspects, we think that we should develop, at the state level, a methodology for creating and capitalizing on the innovative potential within the higher education institutions. This

methodology would help higher education institutions to generate and implement innovations and would support them in their patenting process.

4. Arguments to support the thesis

According to Drucker, in business, innovations rarely appear as a flash of inspiration. They originate more in the process of "conscious target search of the opportunities for innovation", which can be found in few cases and most innovative business ideas come from methodical analysis of seven opportunity areas, some of which are found within the company or certain industries and others - outside the enterprise: broader social and demographic trends. Peter Drucker emphasized that in order to initiate, organize and carry out a process of innovation it is necessary to continuously monitor the opportunities for innovation that are unpredictable and must be analysed as interrelated parts of the same system of innovation opportunities [8].



Institutions	Human Capital and Research	Infrastructure	Market structure	Business environment structure
Politic Environment	Education	Information and Communication technologies	Credits	Intellectual Area Workers
Regulatory Environment	Tertiary Education	General Infrastructure	Investments	Innovation bonds (links)
Business Environment	Research and Development	Ecological sustainability	Trade and competition	Absorbing knowledge

Knowledge and technology	Creativity
Creating Knowledge	Intangible assets
Knowledge impact	Creative goods and services
Knowledge Dissemination	Online Creativity

Figure 1. The Activity Framework of Global Innovation Index

http://globalinnovationindex.org/content.aspx?page=gii-full-report-2015

Besides the fact that the *Global Innovation Index* enables a more or less objective assessment of innovation capabilities of a large number of countries, it does not allow the assessment of the contribution and the impact of innovation component in the economic development of the countries, although there is a close and direct correlation between them.

On the other hand, innovation is not a goal in itself. It is the precondition for creating a knowledge-based economy and a highest priority for improving the competitiveness of the national economy. Finally, the economic development of a country has the aim to provide the citizens with a decent life, an appropriate level of welfare adequate to contemporary stage of development and dignified living conditions for fully realizing their human potential. Economic competitiveness is a complex phenomenon that reflects the capability of the country to form and to ensure an economic, social and political environment on the road to supporting the accelerated creation of the added value.

In Figure 2, we have presented the way of activity and functioning of the Global Competitiveness Index.

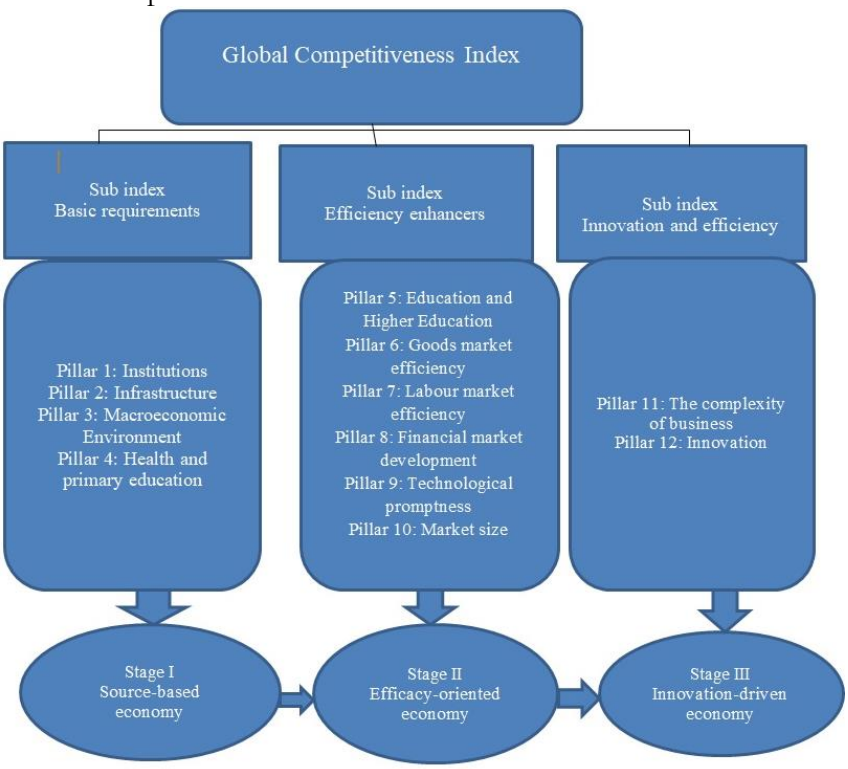


Figure 2. Global Competitiveness Index Way of Activity

Source: Innovation study, AGEPI

At international level, the World Intellectual Property Organization develops the Report on Global Innovation Index, which contains a thorough analysis of several indicators certifying the economic situation of the innovation in a certain country. Accordingly, this report examines 143 countries. These analyses are based on several key indicators such as human capital and research, infrastructure, credits, investments, interconnections, innovation and creative activity results, which, in turn, are grouped into other sub-indicators reflecting the state of the economy of a country at the innovation chapter [9].

Thus, analysing the report in 2014 the IGI, the topic of which is "The human factor in the development of innovation" – we note that this report focuses its attention on exploration of human capital in the innovation process while emphasizing the growing interest of small and medium enterprises and governments towards creative people.

The Republic of Moldova was ranked 43 out of 143 countries in the Global Innovation Index rankings. Our country has accumulated 40.74 points out of 100 possible. Thus, Moldova climbed two positions compared to the previous year. This position reserved by our country is largely due to the performance recorded in the field of "Knowledge Creation" and "Intangible Assets", which include objects of intellectual property, where the highest results were recorded. They demonstrate that the National Office of Intellectual Property - AGEPI - is effective and the intellectual property law is in accordance with international and European principles and standards [4].

If we analyse the data from the Global Innovation Index Report for 2015, we can mention that our country has managed to occupy the first position in the category of countries with gross national income below average, compared to the number of inhabitants. According to this report, our country ranked 44 of 141 monitored countries [5].

The Global Innovation Index is based on 81 indicators including the human research and capital, infrastructure, credits, investments, interconnections, innovation and the results of creative activity. The Republic of Moldova has gained 40.5 points of 100 possible.

Analysing, the Global Innovation Index Report for the years 2014-2015, we should review the most important indicators that have contributed to its formation, which are shown in Table 1.

Table 1. Sub-indices that led to the formation of the Global Innovation Index

Name	**Value, 2015**	**Position, 2015**	**Value, 2014**	**Position, 2014**
Global Innovation Index	40,5	44	40,7	43
Input innovation sub-indices	40,1	31	42,1	30
Output innovation sub-	41,0	74	39,4	80

indices				
Innovation rate efficiency	1,0	5	1,1	1
1. Institutions	59,0	75	58,4	80
1.1. Political environment	47,0	78	55,5	75
1.2. Regulatory environment	56,1	98	55,9	101
1.3. Business environment	74,0	53	53,7	74
2. Human and research capital	27,6	74	28,6	71
2.1. Education	55,8	26	55,8	21
2.2. Tertiary education	21,5	100	24,0	92
2.3. Research and Development (R&D)	5,7	78	6,0	81
3. Infrastructure	36,0	82	31,9	88
3.1. Information and communication technologies	55,1	48	43,0	58
3.2. General Infrastructure	24,1	104	25,2	111
3.3. Environmental sustainability	28,9	98	27,5	104
4. Market development	50,6	52	51,4	49
4.1. Credits	36,6	51	42,9	51
4.2. Investments	38,9	56	35,6	66
4.3. Trade and competition	76,2	72	75,7	68
5. Business development	31,7	83	26,8	102
5.1. Knowledge workers	36,8	74	36,0	81
5.2. Innovation links	20,9	121	18,7	132
5.3. Knowledge absorption	37,4	72	25,8	66
6. Knowledge and output technologies	39,6	26	408	26
6.1. Creation of knowledge	43,2	20	48,0	16
6.2. The impact of knowledge	42,6	45	36,8	74
6.3. Dissemination of knowledge	33,0	47	37,6	40
7. Creative Output	40,5	38	43,3	32
7.1. Intangible assets	68,1	3	68,4	3
7.2. Creative goods and services	21,7	62	22,6	53
7.3. Online creativity	4,3	93	14,0	80

Source: Global Innovation Index Report IGI, 2014, 2015

Based on the above-mentioned facts, we notice that, during last years, the Republic of Moldova has followed its positions in the Global Innovation Index Ranking. Thus, this fact constitutes an argument that demonstrates the efficiency of the legislation in the field and the efficiency of AGEPI, which contributes to Moldova stepping-up in this respect. Nevertheless, a very important aspect that should not be neglected is the fact

that the Republic of Moldova does not make important steps regarding the patenting of innovations. Therefore, a methodology should be developed to help and guide higher education institutions to patent their own inventions.

This methodology would help the Republic of Moldova to capitalize on the innovative potential of higher education that is a necessity for higher education institutions claiming to be competitive.

5. Arguments to argue the thesis

In addition, the analysis of the specialized literature demonstrates the fact that the conceptual aspects of innovations, inventions, i.e. the theoretical and legislative aspects, are well grounded in the Republic of Moldova, however, the practical aspects are less substantiated.

There are, however, arguments that might contradict the fact that in the Republic of Moldova the valorisation of the innovative potential within the higher education institutions is a necessity. Proceeding from the behavioural observation of many actors in higher education, it can be mentioned that higher education institutions can choose the path they will go by, and it seems that the valorisation of the innovative potential already appears as an aspiration. But it must be emphasized that in order to be competitive, in order to attract students and provide attractive educational programs, higher education institutions in the country must capitalize on their innovative potential and generate innovations that can be patented afterwards by AGEPI.

6. Conclusions

As a final point, it should be noted that this paper is a qualitative approach in order to motivate the need to capitalize on the innovative potential at the country level, and, particularly, within higher education institutions. The theoretical and legislative aspects of the innovations and the innovation process were investigated in the paper. Similarly, the investigated aspects have been critically interpreted, bringing arguments supportive of the analysed theories. At the same time, we have to mention that some practical aspects regarding the positioning of the Republic of Moldova in the ranking of the Global Innovation Index have been analysed in this paper, thus giving arguments in favour of the analysed theories. Also, there were interpreted the results of the ranking, the practical aspects of the sub-indices in which Moldova occupies the leading positions and those Moldova has to advance in the near future.

Based on the analyses carried out, it can be noticed that there is a massive potential for development of innovative management in the Republic of Moldova within higher education institutions through the development of an innovative culture in the academic environment. Students, who are often the artisans of innovations, need to be stimulated and helped, involved in various projects, focus groups, in order to provide opportunities to create, to develop the potential they possess.

In conclusion, we can mention that the Republic of Moldova has shown that it has a vast potential to create, to build an innovation economy, to move towards a competitive developed economy, where the basic emphasis is placed on innovation and technology transfer. Appropriate and thoroughgoing development and improvement of the innovative potential are essential in the university environment, since it is the environment where we create and where innovations occur. This need arises from the requirement to be competitive on the market and to be able to further develop a thriving economy.

One problem that remains, however, it is the fact that a very small number of creations, ideas and inventions that are created are brought as new product to the final consumer. At this point, the Republic of Moldova must still endeavour to use all the ideas, inventions and try to bring them to the market, to the final consumer.

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