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Article

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Development of the entrepreneurial university (University 3.0) in Belarus: An overview of determinants and challenges

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Abstract

The global knowledge economy and entrepreneurial society demand innovative and entrepreneurial organisations that efficiently respond to societal challenges. In these scenarios, universities are playing a crucial role in regional and country development; especially, those universities that have transformed their capabilities and routines to become more innovative (create and disseminate knowledge) and entrepreneurial (implement new sustainable business models) organisations. In this regard, this policy paper discusses the terminologies, the determinants of the entrepreneurial and innovative university (University 3.0) evolution in Belarus. Authors highlight the crucial role of institutions (formal/informal) in the configuration of this type of university in Belarus and provide recommendations on the development of a University 3.0 as a new, private institution with a high degree of autonomy.

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Keywords:

Knowledge economy; entrepreneurial economy; entrepreneurial universities; University 3.0; Belarus,

1. Entrepreneurial University or "University 3.0”: An Overview

Over the past decades, in most developed countries, universities have faced a transformation of their capabilities and activities to become more innovative and entrepreneurial organizations, as well as to generate social and economic value (O'Shea et al., 2005; Kirby et al., 2011; Guerrero & Urbano, 2012; Guerrero et al., 2015; Marozau & Guerrero, 2016; Marozau et al., 2016). The academic literature justifies this phenomenon by adopting two perspectives. On the one hand, universities are sources of knowledge, innovation, technologies (Isaksen & Karlsen, 2010; Gonzalez-Pernia, et al., 2014), and human capital (Carree, et al., 2014). On the other hand, universities provide an enabling environment for the development of innovative entrepreneurship (O'Shea et al., 2007; Guerrero & Urbano, 2019b). The university transformation was motivated by the rapidly changes in the global context (introduction of the "third mission"). Based on these tendencies, Western universities are trying to turn into innovation and entrepreneurial organisations (Gibb & Hannon, 2006) through entrepreneurial behaviours and competencies (Roepke, 1998).

From the public and university authorities’ perspective, there is a concernment in an efficient allocation of public budgets, to ensure the quality of education, to be competitive, and to achieve leading indicators in the international scope (Guerrero & Urbano, 2019a). As a result, researchers and practitioners are working together for providing a better understanding of concepts, approaches, and models that support the transformation of universities (e.g., HEInnovate initiative, UK REF2021, and others).

In Western countries, this phenomenon is known as "Entrepreneurial university" (Clark, 1998]). Several authors have contributed with relevant insights about this phenomenon adopting mixed perspectives such as knowledge transfer, entrepreneurship education, strategic management, academic entrepreneurship, graduate entrepreneurship, university-industry collaborations, and among others (Guerrero & Urbano, 2019a).

In the Russian-speaking space, this phenomenon has been regarded as a new-generation university or “University 3.0” (Wissema, 2009).

A plausible explanation about the implementation of this perspective could be that, in the post-Soviet context, entrepreneurship has been not perceived by society as part of the

university role. Furthermore, the use of a numeric component in this terminology helps to make the evolutionary process more visible. As a consequence, the University 4.0 could correspond to the transformation stage influenced by Industry 4.0. It explains why the Belarusian academic community and officials have adopted this approach.

Despite some conceptual differences, both terminologies assign a crucial role to a radical revision of university management principles – becoming flexible, reduction of bureaucracy, readiness for risk, modernization of an incentive system, decision-making decentralisation, and autonomy of institutes, faculties, and departments.

For the purpose of this paper, we adopts the term of "University 3.0" defined as a subject of economic and social systems, forming a favorable environment for the implementation of the entrepreneurial potential of employees, students and graduates, developing an entrepreneurial culture, where, along with a high level of education and research, innovative entrepreneurship is actively developing for economic and social development (Marozau, 2015, p. 3).

According to this definition, the third "entrepreneurial" function is inseparable from educational and research, and its implementation is improving the effectiveness of the other two to maximise the socio-economic effect (Figure 1). Therefore, if teaching and research have been interrelated for centuries, the innovative and entrepreneurial perspective helps to update competencies, knowledge, and skills required in the current labour markets and entrepreneurial economy. For instance, by developing an entrepreneurial/innovative project a student/researcher will be able to acquire skills associated with identification of sustainable opportunities, problem solving, managing people and collaborating with stakeholders, fundraising, of assuming risks, and capturing sustainable outcomes.

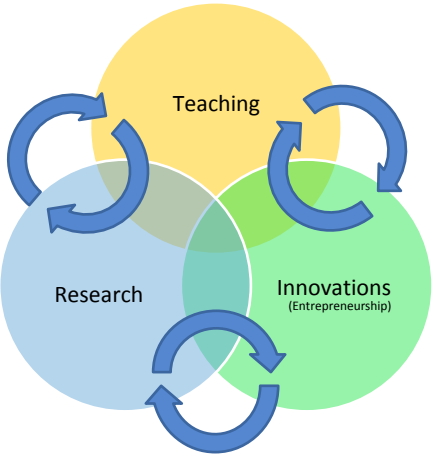

Figure 1. Interrelation among the University 3.0 missions

Source: Own elaboration based on Etzkowitz (1998)

2. "University 3.0": Internal and external determinants

Adopting the fundaments of studies on entrepreneurial universities (Bercovitz & Feldman, 2006; Kirby et al., 2011; Guerrero & Urbano, 2012, 2019a), the creation and development of the University 3.0 should be influenced by certain external (institutional) and internal (resources and capabilities) conditions that are needed to produce the outcomes (human capital, knowledge capital and entrepreneurship capital) that will contribute into the socio-economic development (Figure 2).

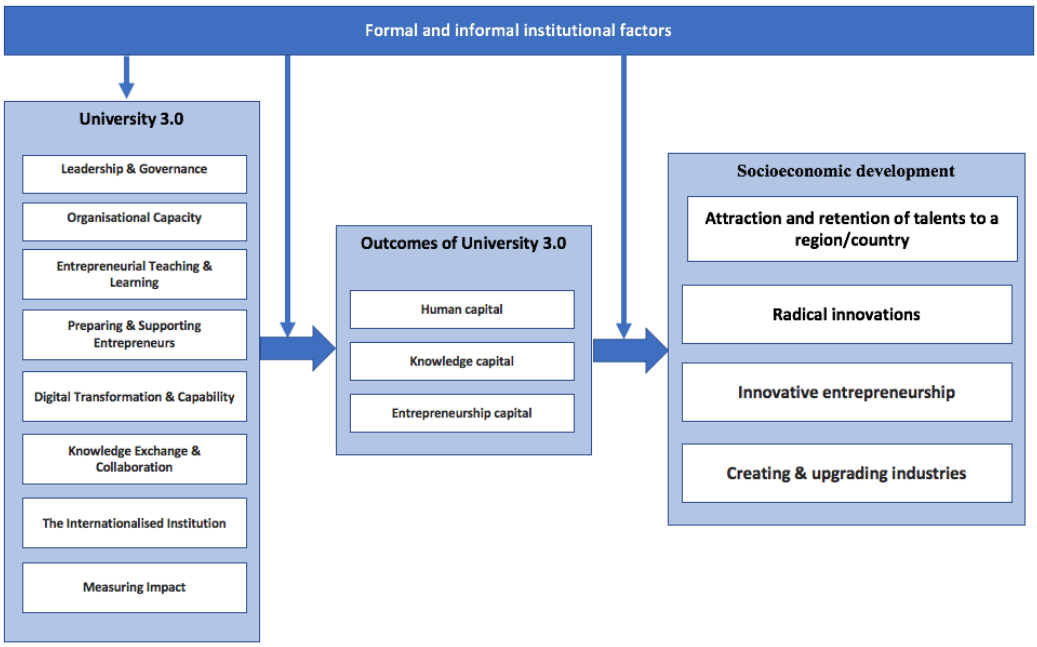

Figure 2: Conceptual model of University 3.0

Source: Self-devised based on HEInnovate and Guerrero & Urbano (2012)

2.1 External determinants

Any organisation is influenced by "rules of the game in the society" (North, 1990). These rules of the game are well known as the institutions that configure the social and economic evolution of any industry, region, and country (North, 2005). Therefore, the quality of institutional conditions explains the stages of growth and development across countries used by the World Economic Forum (WEF, 2018; Marozau et al., 2016).

According to the WEF (2018), developed economies are characterised by institutional factors that promoting the generation of new innovative and entrepreneurial initiatives. In this vein, any entrepreneurial and innovative capability of organisations or regions is influenced by the quality of their institutional context (Guerrero and Urbano, 2019b). It explains why certain institutional voids generate uncertain effects on entrepreneurial innovations in emerging economies (Aidis et al., 2008; Mazarou et al., 2016). Therefore, institutional factors are understood as the external determinants of the University 3.0 (Guerrero & Urbano, 2012).

Adopting the institutional economic approach (North, 1990), there are two types of institutions: formal (regulations, policies, codes) and informal (social norms, values, behaviours). By adopting this classification, the University 3.0 is mainly influenced by formal institutions as well as informal institutions (Guerrero and Urbano, 2019b).

a. ***Formal institutions***. First, the higher education legislation that delimitates the degree of autonomy (e.g. scope, missions/core activities, financial/organisational structure, type of management). Second, the country's R&D and entrepreneurship legislations that legitimise the role of universities within the innovation/entrepreneurial ecosystems (e.g. types of collaborations with the industry and other agents, subsidies or incentives). Third, intellectual property regulations that clarify the property of innovations and technologies generated within universities, as well as their commercialization mechanisms (e.g. patents, licenses).

b. ***Informal institutions***. First, the values of the society (e.g. if entrepreneurship is perceived as a career option) as well as of the university community (students, staff, academics, researchers, alumni) attitudes towards innovation and entrepreneurship (e.g., endorsements or sanctions of those who decide to exploit entrepreneurial innovations). Second, the existence of successful role models within the university context (e.g. students/researchers who have created an innovation or entrepreneurial initiative for solving an existing problem or covering an unsatisfied market). Third, an entrepreneurial and innovative mindset in society (e.g. the level of creativity and fear of failure).

Previous studies have shown that the core institutional obstacles during the transformation process of universities in transition economies is associated with the underdevelopment of public/private financial mechanisms for supporting universities' innovations (Tchalakov et al., 2010); the inefficiency of technology transfer channels (Etzkowitz et al., 2000); the weak intellectual property systems (Aidis et al., 2008); the imperfect incentives for universities (Marozau & Guerrero, 2016); the unfavorable attitudes towards entrepreneurship within universities (Grudzinsky, 2005); and the existence of institutional voids such as opportunistic

behaviours or corruption promoted by subsided university-industry collaborations (Guerrero & Urbano, 2019a).

In Belarus, due to the stage of development (the efficiency-driven stage), the crucial institutional determinants have been the education system, the financial market, and the efficiency of the labour market (WEF, 2018). However, the feasibility in the transformation toward Universities 3.0 is not self-evident. The analysis shows that the State's efforts to transform universities may be futile given the unpreparedness of the economy and institutions. Besides, the institutional configuration of Belarus has been influenced by two institutional regimes that directly determine the convergence regarding the economic perspective about innovation and entrepreneurship.

2.2 Internal determinants

Any organisation is composed of resources and capabilities (Wernerfelt, 1984). Therefore, the quality of these resources and capabilities explains the competitive advantage, performance, and growth (Barney, 2001). From the academic point of view, Guerrero and Urbano (2012) identified crucial resources (human capital, physical infrastructure, funding) and capabilities (strategic alliances/networks, leadership, strategic management). From the policymaker point of view, the European Commission and the Organisation for Economic Co-operation and Development (OECD) proposed a tool called "HEInnovate" that integrates several internal factors to assess the entrepreneurial and innovative potential of universities. Based on the compinations of both perspectives, the University 3.0 is mainly integrated by resources as well as capabilities for achieving their core activities.

a. ***Resources***. First, the attraction/retention of talented people (e.g. students, researchers, managers) and public/private fundings (e.g. from companies, non-profit organisations, alumni) that are required for the implementation of the university strategy. Second, the implementation of training programs to stimulate entrepreneurial thinking and innovative competencies required to transform the university culture and routines. Third, training and support infrastructure (e.g. technology transfer offices, incubators, accelerators, mentoring programs,

entrepreneurship courses, connecting with university networks) for supporting students/academics interested in developing entrepreneurial and innovative initiatives. Fourth, digital infrastructures that allow effective integration of initiatives with the university with local, national, and international agents involved in entrepreneurial innovation ecosystems.

b. ***Capabilities***. First, an effective system of corporate governance (e.g., management and leadership) that develops a strategy based on the stakeholder's vision as well as the entrepreneurial and innovative culture. Second, network capabilities that allow transferring and sharing of resources, knowledge and risks with diverse stakeholders (e.g., industry, government, research centres, financial agents). Third, the implementation of competitive strategies oriented towards positioning the university at the international scope (e.g. internationalisation process), as well as generating/capturing the value created through the core activities (e.g., impacts of the academic community on the society via talented graduates, knowledge generation, commercialisation)

In Belarus, due to the stage of development (the efficiency-driven economy), the crucial obstacles in terms of university internal factors have been the lack of educational and research infrastructure supporting entrepreneurial innovations initiatives (patenting, licencing, spin-offs). Notwithstanding the state's efforts (e.g. the Hi-tech Park and the Belarusian-Chinese Industrial Park), the reinforcement of organisational/regional capabilities that actively contribute to the creation/development of entrepreneurial and innovation ecosystems is still a challenge.

3. An international benchmarking: the Belarusian challenges and opportunities

Many developed countries have implemented several policies and initiatives for supporting the university transformation. Unfortunately, some developing countries continue imitating university practices (internal determinants) but ignoring the diagnosis of their institutional configuration (external determinants). In this section, we discuss five initiatives

implemented across the world as an exercise for identifying potential alternatives to reduce gaps/limitations observed in Belarus.

3.1 New Zealand – a fast-growing innovation ecosystem

In New Zealand, the The Entrepreneurial Universities initiative oriented to strengthen the fast-growing innovation ecosystem was implemented. The main focus was on bringing the world's leading entrepreneurial scientists to universities to improve capabilities and drive entrepreneurship and innovations in the global scope. This initiative was half-funded by the state and half-funded by universities (funds could be obtained from stakeholders or own resources). Universities were empowered to define priority areas for regional development. During 4 years, the total investment of this initiative was 22 million USD in order to attract 15-20 top researchers from around the globe. The annual funding for one university did not exceed 1 million USD. It is important to note that the initiative was coordinated by the Ministry of Business, Innovation and Employment, not by the Ministry of education. This initiative can be relevant to the Belarusian context since many Belarusian innovative companies have extensive ties with foreign research centers. Therefore, this type of initiatives could reinforce the university capabilities by attracting talented researchers for a few years as well to develop companies' priority areas.

3.2 The United Kingdom: Centre for Entrepreneurship Education and Development

Another international initiative was the establishment of Centre for Entrepreneurship Education and Development (National Entrepreneurship Council) in the United Kingdom in 2004. This national body focused on strengthening entrepreneurial capabilities of the higher education sector by supporting long-term cultural changes, creating a favourable institutional environment, as well as developing national policies in this area. The main objective is the development of university leaders with an innovative vision, as well as a management system conducive to entrepreneurship and innovation. In the Belarusian context, this type of initiatives could stimulate the transformation of existing universities through the development of entrepreneurial and innovative capabilities of university leaders and managers.

3.3 Romania: "From Knowledge to Innovation"

In Romania, the outsourcing-oriented IT sector has been growing faster than any other sector drawing talented employees from other industries. In this scenario, in collaboration with diverse stakeholders, Romanian universities launched an initiative called "From Knowledge to Innovation" to ensure the flow of skilled employees and entrepreneurs among sectors. By providing specialised training programs to a diversified market (teachers, university leaders, students), this project captured the funding and consulting support for implementing their university transformation process by creating an environment for developing collaborative, entrepreneurial, and innovation projects between students and leading enterprises.

3.4 South Korea: University of Science and Technology

Another initiative to improve regional scientific/technological capabilities has been the foundation of the Pohang University of Science and Technology in South Korea by the leading steel company (POSCO). This initiative was inspired by the California Institute of Technology. In this vein, the POSCO company placed its research institute within the university campus. This active link between education, research, and innovation enabled positioning the university as one of the best scientific and technological universities in Asia. In the 2000s, the university was ranked in the top 100 universities in the Times Higher Education Ranking as well as in the QS World University Rankings. From 2012 to 2014, the university was positioned at the top in the group of young universities. More than 50% of university budget of 300 million USD is generated from innovative projects and grants. The success factors of this experience (an entrepreneurial innovation vision, attraction/retention of outstanding human capital, and the corporate management orientation) could be an inspiration for enhancing the collaboration between universities and companies in Belarus.

3.5 The Estonian Entrepreneurship University of Applied Science

Another example of a young and small university (1600 students) is the Estonian Entrepreneurship University of Applied Sciences. It is the largest private university in Estonia

that is located in the business Park Ülemiste City (Tallinn) together with more than 300 companies. The university provides higher education programs in two priority areas for the digital transformation of the country: (1) IT and (2) Business & innovation. As a result, this initiative has a broad perspective involving multiple agents (business, government, academic community) in the development of new generations of professionals with an entrepreneurial and innovative culture; the legitimisation and reputation of the role of universities in society; and the emphasis on entrepreneurial and innovative capabilities across the university community.

4. Concluding remarks and recommendations

The third "entrepreneurial" mission requires universities' capabilities to be flexible, innovative, assume risks, develop entrepreneurial culture and management system. Therefore, the central dilemma in the implementation of the University 3.0 strategy should be to try to reform the existing universities or create a new one. Primarily, this dilemma applies to the centralised higher education system where universities do not have the autonomy, including financial. In this regard, a new generation of universities is forced by the changing institutional conditions, including approaches to financing education and science, as well as to the request from the actors of the innovation system, and not by the decision of state bodies. In this scenario, the role of the state is to choose priorities and create an enabling institutional environment.

In Belarus, the University 3.0 presents two potential alternatives: 1) the formation of a new university in the legal regime of the Hi-tech Park; and 2) the transformation of leading existing universities within the higher education system. Table 2 shows the elements that should be considered in the creation and development of the University 3.0 per option. This exercise helps to clarify the two sides of the coin.

The urgent task of increasing the quantity and quality of specialists for the IT sector (software engineers, system engineers, etc.) does not require the significant transformation of leading universities and a fortifori the creation of a new university. In addition, non-governmental centres and institutions established by IT companies (e.g. Institute of IT, Business administration, EPAM Training Center, etc.) successfully cope with this task.

Table 2. Factors to be considered in the creation/development of the University 3.0 per option.

Criteria	Alternative 1: Creation from scratch in the Hi-tech Park	Alternative 2: Transformation of the existing university
Formal institutional factors		
Legislation in the field of technology transfer, innovative entrepreneurship and venture financing	Decree No. 8[2] significantly expands opportunities for the development of start-ups and attracting funding	The accession of an educational institution into Hi-tech Park will help to level the difference
Intellectual property legislation	No difference	
The existing management system of universities, including the system of motivation of management	Application of best practices of manageming business and innovation. Implementation of the corporate governance system	Does not allow to operate effectively in the conditions of uncertainty and global competition in the implementation of innovative, high-risk projects
Significant statutory autonomy of universities, including financial, in the development of a strategy and tools for its implementation	More significant opportunities for innovation strategy implementation and diversification of funding sources	Requires a significant revision of the legislation and practices of the Ministry of education
Informal institutional factors		
The value system and the attitude of the population and the academic community about entrepreneurship	the existing entrepreneurial and innovative culture	Traditional academic values, understanding the purpose of the University 3.0 in making money
The presence of role models-successful innovators and entrepreneurs from universities	the Examples of EPAM, Wargaming, MSQRD, Flo	Associated with the wave of "academic" entrepreneurship of the 90s (ADANI, izovak) and are no longer relevant
The formed idea of expediency of teaching entrepreneurship	Active development of product-oriented IT companies has increased the demand of companies for entrepreneurial	Is considered as an additional burden/fad at the request of the Ministry of education

[2] The Decree #8 On the Development of Digital Economy of the President of the Republic of Belarus signed in December 2017 included measures to liberalize the conditions for conducting business in the sphere of high technologies, Extension of the period of the special legal and tax regimes of the High-Tech Park until January 1, 2049 and introduced some English law institutions for residents of the High-Tech Park such as option contracts, convertible loan agreements, non-competition agreements with employees, agreements with responsibility for enticing employees, irrevocable powers of attorney.

Criteria	Alternative 1: Creation from scratch in the Hi-tech Park	Alternative 2: Transformation of the existing university
	competences.	
Internal factors		
Management and leadership	It is easier to attract and form a management team of qualified people with experience in creating and managing business schools, corporate universities (rather than appointed administrators)	The choice is limited mainly to representatives of the university community and officials.
Organisational capacity, people and incentives	There is no developed teams and scientific schools. Depending on the strategic priorities, the invitation of specialists and teams for specific areas. Flexibility in working conditions (requirements for degrees, availability of full-time employees, distance work, monetary incentives).	Is developed to a greater extent for the implementation of the educational function is. Quite matured personnel with the existing system of relations and values. With a wide range of specialities, the system of ensuring multidisciplinary education and research has not been developed.
Entrepreneurship training	The possibility of the rapid introduction of advanced techniques, participation in innovative projects.	To some extent discredited approaches to teaching entrepreneurship (the study of legislation, development of a business plan).
Training and support of entrepreneurs	Business incubator in Hi-tech Park – a key player in the sphere of support of innovative business	Availability of several technological parks, start-up schools. The lack of success stories
Digital transformation	It is an integral part of the creation process, does not require a change in the status quo	the introduction of digital technology is usually slow and inconsistent, causes resistance.
Knowledge sharing and cooperation	It is essential to place directly in the Hi-tech Park (in the heart of the cluster) for interaction within the existing ecosystem (large companies, startups, investors, mentors, consultants).	In existing universities there are no established centres of innovation and entrepreneurship. There are joint initiatives, projects, laboratories with individual companies, research institutes.
Internationalisation	Underdeveloped relations with academic institutions abroad. It is necessary to attract well-known researchers and managers with a developed network of contacts. The experience of Hi-tech Park's residents, which should feel like stakeholders of the university, will be useful.	Established international relations, the experience of participation in international educational and research projects

The creation of the University 3.0 from scratch (on the basis of Hi-tech Park) has a number of advantages in terms of institutional factors (a change of which always takes a longer

period of time). However, the transformation of leading universities will not require significant expenses to attract specialists, to build an educational and research infrastructure. At the same time, the corporate governance system of the university will be as in a "corporate university" or an"vocational university". Even at the stage of strategy development, the main directions of training and research should be multidisciplinarity. Therefore, to position the new university, not as an alternative to leading ones, but as a competitor to European and Russian universities, since the outflow of student is increasing every year. At the same time, the niche of elite higher education is free in Belarus. Existing independent research centres, as well as laboratories or educational centres of Hi-tech Park's residents could become essential elements in the establishment of the university due to their experience, research/ educational potential, and connections.

In this context, it is important to analyze the experience of the transformation of existing Belarusian universities. In particular, the pilot project "Improving the activities of higher education institutions based on the University 3.0 model" was launched in 2018. Firstly, the absence of the pilot project's text, roadmaps for the selected universities, and implementation reports in the public domain does not enable to assess it. The principal drawback of its description is the emphasis only on entrepreneurship education, building entrepreneurial infrastructure, and commercialisation of intellectual property, while neglecting the existing system of governance and incentives in higher education. Second, without university leaders' awareness of the need for changes and without institutional conditions for the transformation of universities, any effort and public funds will not produce the expected effect and cause dissatisfaction of the university community (Marozau, 2019).

In conclusion, it should be noted that universities are one of the most rigid organizations, with their own rules, values, and incentives for achieving educational and social goals (Röpke, 1998). In this regard, the primary functions of universities should not be overlooked in the pursuit of entrepreneurial mission. Also, this function should not be wrongly seen as make profits or to meet the needs of the industry. Finally, as with any reforms, institutional factors must be taken into account, the imitation of best practices is not always appropriate because the period of transformation could take many decades.

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