

WHAT CAN BE DONE FOR THE UNIVERSITY TO BECOME AN ENTREPRENEURIAL UNIVERSITY?

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ABSTRACT

Universities have undergone significant transformation as a result of new paradigms in the world. Entrepreneurship is found as one of the solutions for this adaptation process by developed countries. Entrepreneurship in higher education forms a basis for innovation. In this regard, the paper presents the changes and challenges that the universities have to face nowadays, offering a model of entrepreneurial university, with its necessary characteristics. It depicts how modern universities may benefit from different types of entrepreneurship by transforming its universities to a model of productive, innovative and quality assured institutions while showing the triple helix system of relationships between university, industry and government.

Keywords: Entrepreneurial University, Triple Helix, Higher Education, Innovation

TRANSFORMATION OF UNIVERSITIES' FUNCTIONS

It is well documented and understood that universities are in an era of transition. No longer are universities simply teaching and research institutions; they are now increasingly expected and even sometimes required to engage formally with the economy and society (Nelles & Vorley, 2010).

In the modern society, due to the rise of knowledge-based economy, information technology, and global competitiveness, the functions of university have been expanded from its original task of preservation and knowledge transfer, to production of new knowledge and more recently to knowledge exploitation for innovation (Etzkowitz and Dzisah 2007; Etzkowitz and Zhou 2007; as cited in (Sam & Van Der Sijde, 2014).

The universities start to act as active participants of economic relations, gradually extending their entrepreneurial functions. Essential development factor of entrepreneurial aspects in activities of universities is limits of government funds for university degree system, necessity to diversify financing sources, relevance for academic science to close business segment. Elements of entrepreneurship are consistently integrated and spread in different lines of actions of advanced educational establishment. International activity of advanced universities is on immense rise. For them not only to work successfully, but also become leaders of current global educational system, the universities have to reinforce and diversify their activity. Actually, entrepreneurial and international aspects pervade all major lines of actions of advanced leading universities (Kalenyuk & Dyachenko, 2016).

Transformation of Universities' Functions

Traditional functions of university	Entrepreneurial activity	International activity
educational, formative activity	- services diversification (programs of different duration, levels, teaching techniques); - extending of services range for both main and allied ones, chargeable	- active involvement of prospective university students and consumers at the external markets
Scientific research activity	- extending of scientific research activity; - commercialization of scientific research results; - range extension of allied intellectual services (consulting); - creating of scientific parks, techno-parks, business incubators within the universities	- academic mobility; - participation in international scientific projects; - publications of the results in international journals; - participation in syndicate of universities to carry out international scientific research projects;
Marketing	- energetic advertising campaign at the national and international levels; - search for sponsors; - work with graduates as potential patrons; - participation in national and world ratings of universities	
Financial business activity	- search and diversification of additional funds - forming of endowment fund; - extension of financial autonomy	- search of foreign investors and partners; - extension of export scale of educational and other services

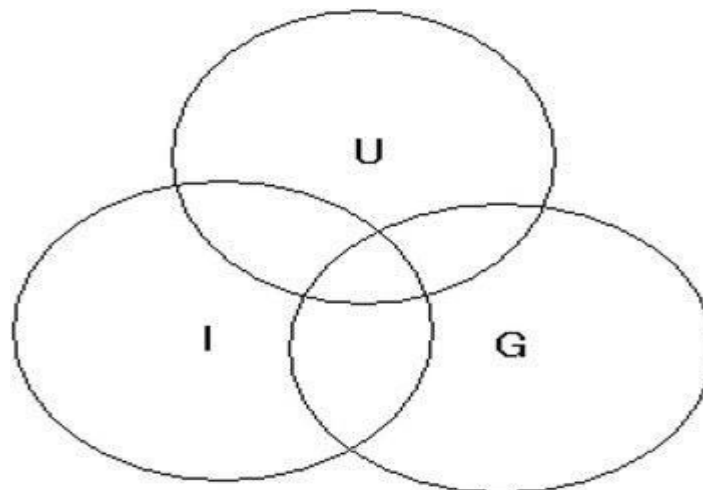
(Kalenyuk & Dyachenko, 2016)

Universities exist to generate knowledge through teaching and research, but it is also incumbent on them to ensure that the knowledge created is of social and economic value. This gave rise to the awareness that the research and teaching activities of universities would need to be socially and entrepreneurially underpinned through the strategic networking of universities with key players in the wider economy. This awareness has led to the emergence of two concepts: the 'third mission' and the 'triple helix mission'. These concepts together define the trajectory along which universities evolve to impact the economy and society (Nakwa & Zawdie, 2016).

TRIPLE HELIX

The relationships among universities, industries and governments have become necessary to account for the capitalization of knowledge, and the "triple helix model" is a useful framework to explain these interactions. In the triple helix model, universities and other knowledge-producing institutions can play a new role in the knowledge-based society by focusing on dynamics and utility of knowledge. Beside the traditional missions such as education and research, universities now can organize technology transfer and entrepreneurial activities. The triple helix model provides a flexible framework to guide societal efforts for the common purpose of stimulating knowledge-based economic development (Lee & Ngo, 2012).

The triple helix model involves a network of relationships between university, industry and government (U-I-G). As such, it offers firms, organizations and institutions the opportunity to develop complementary capabilities and to tap into other systems of innovation and learning which can give them access to a wider range of solutions to technological problems (Saad, Zawdie, & Malairaja, 2008).



*The triple helix illustration of university-industry-government sphere relations.

University–industry–government interaction is key to improving the conditions for innovation in a knowledgebased society. Industry is a key stakeholder for universities, as it represents the locus of production, whereas government is important because it represents the source of interaction with the country’s economy and public policies (Fayolle & Redford, 2014).

The emerge of entrepreneurial universities to be the hallmark of the ‘triple helix’ model in which universities feature as the main drivers of regional development (as in the ‘fully integrated model’); or as leaders in the formation of knowledge network (as in ‘university-led model’); or as agents securing resources from industry for knowledge generation and transfer (as in the ‘external support model’). Most of the successful universities in developed countries are said to conform to the ‘external support model’. However, in developing countries, the industrial sector is not strong enough to support universities, so that it is the first and second models that seem to be relevant (Nakwa & Zawdie, 2016).

A fundamental feature of the triple helix model is its aim to bring together different actors, capitalizing on their interactions in order to provide a comprehensive understanding of the innovation process and its key determinants (Saad, Zawdie, & Malairaja, 2008).

The Triple Helix explains the creation and consolidation of learning societies, deeply rooted in knowledge production, innovation and dissemination, and in a well-articulated relationship between universities, industry and government (Fayolle & Redford, 2014).

The merit of the system is that it is capable of creating the conditions for generating, sharing and disseminating appropriate knowledge that is conducive to quick learning and innovation necessary for speedy catch-up and growth (Saad, Zawdie, & Malairaja, 2008).

THE IMPORTANCE OF ENTREPRENEURIAL UNIVERSITIES

Due to the rapidly changing needs of the knowledge-based society and the local and global competitiveness, people’s knowledge, skills and resourcefulness have become increasingly important. The competitiveness and rise of the knowledge-intensive economy have posed great challenges to governments in both developed and developing nations to overcome and encourage them to also make higher education (more) responsive to the competitive labor market in the globalized society. Hence, governments are challenged to enhance the higher education system in order to produce more highly-educated people for social and economic development (Maassen and Cloete 2006; as cited in (Sam & Van Der Sijde, 2014).

The role of the entrepreneurial university is increasingly being seen as important for finding new ways to compete and succeed in uncertain and unpredictable environments and for finding new solutions to the multiple challenges that need to be addressed for the public good, whether local or global (Hannon, 2013).

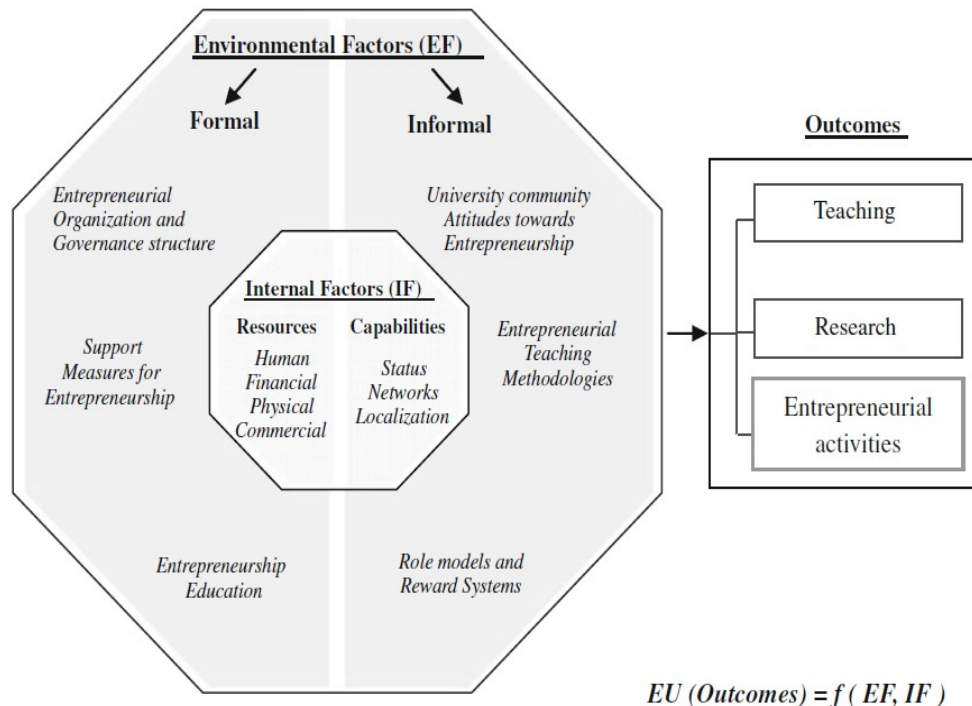
CHARACTERISTICS OF ENTREPRENEURIAL UNIVERSITIES

The conceptual model of an entrepreneurial university is integrated by the environmental and internal factors involved in the creation and development of entrepreneurial universities. The environmental factors have been grouped into formal and informal factors supported by Institutional Economics. Thus, the internal factors have been grouped into resources and capabilities supported by the RBV. Finally, the criteria to measure the outcomes of these universities are supported by the new university missions (Guerrero & Urbano, 2012).

What are the main characteristics of entrepreneurial universities? According to Schulte (Schulte, 2014), we should consider the following basic aspects: □ Formal factors

- Universities’ vision, mission, strategy and objectives
- Entrepreneurial organisation and governance structure
- Procedures and processes
- Autonomy and academic freedom
- Informal factors
- Entrepreneurial culture

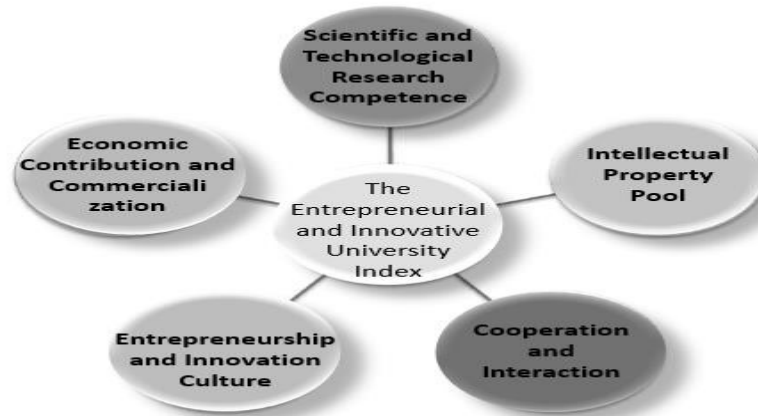
- Special kind of mind-set of the academic and the administration staff
- A set of personal skills and attributes
- Resources
 - Human Capital
 - Financial resources
 - Physical resources like premises, equipment and so on
- Capabilities
 - Status
 - Networks and alliances with universities and companies



(Guerrero & Urbano, 2012)

ENTREPRENEURIAL & INNOVATIVE UNIVERSITY INDEX DIMENSIONS

Turkish universities, have been graded according to a scale called “Entrepreneur and Innovative University Index Indicator Set” since 2012, are competing with each other in terms of their entrepreneur features and processes of capitalizing the services. Entrepreneurial and Innovativeness University Index (EIUI) list is obtained by The Scientific and Technological Research Council of Turkey (TUBITAK). Higher Education Council, Turkish Statistic Institution, Ministry of Science, Industry and Technology, Ministry of Development, Ministry of Treasury, Turkish Patent Institute, Small and Medium Enterprises Development Organization and Universities contribute to this work. List is assembling from 50 Turkish Universities and rankings have been recalculating annually since 2012 in order to encourage entrepreneurship and innovation activities at universities. TUBITAK aims to increase competition among universities and contribute development of entrepreneurship ecosystem in the country by this way. There are 5 dimensions in the cover of 23 indicators. First dimension is “Scientific and Technologic Research Proficiency” which’s weightiness 0,20. Second dimension is “Number of Intellectual Property” and its’ weightiness is 0,15. Third dimension is “Cooperation and Interaction” with 0,25 weightiness. Forth dimension is “Entrepreneurship and Innovativeness Culture” with 0,15 and the last dimension is “Economic Contribution and Commercialization” with 0,25 weightiness. Universities are ranged from top to bottom due to their rankings (İskender & Bati, 2015).



(TÜBİTAK, 2012)

According to this indicator set, universities could find a place in the grading as long as they can get into cooperation with industry, and commercialize their products, in short, as much as they capitalize service. It could be seen in the set that universities are graded not according to their contribution to culture and social services but according to their contribution to the market and commercialization. This indicator set is important in that it shows us how the universities become commercialized and for what purposes they function (Aslan, 2014).

Entrepreneur and Innovative University Index Indicator Set

Size and Weight

Ratio (%)

Indicators

	Number of scientific publications
	Number of citations
	Number of projects received from R&D and innovation endorsement programs
Scientific and Technologic Research Competence (%20)	Amount of funds received from R&D and innovation endorsement programs
	Number of national and international awards in science
	Number of graduates with PhD
Intellectual Property Pool (%15)	Number of Patent application
	Number of Patent letter
	Number of Utility model/industrial design document
	Number of international patent application
Cooperation Interaction (%25)	. Number of R&D and innovation projects done with university-industry cooperation
	. Amount of funds received from R&D and innovation projects done with and university-industry cooperation
	. Number of R&D and innovation projects done with international cooperation
	. Amount of funds received from R&D and innovation projects done with international cooperation
	. Number of instructors/students in circulation
Entrepreneurship and Culture	. Number of programs in entrepreneurship, technology management, and innovation management at license and graduate levels
	. Number of staff working full-time at Technology Transfer Offices, technoparks, incubation centers, and technology development centers
	. Presence of Technology Transfer Office structuring

(%15)

. Number of education/certificate programs in entrepreneurship, technology management and innovation management run outside university

. Number of active firms academics fully or partly own at technoparks, incubation centers, and technology development centers

. Number of active firms university students or graduates of the last 5 years

Economic Contribution and fully or partly own technoparks, incubation centers, and technology development

Commercialization (%25) centers

. Number of people employed at the technoparks, incubation centers, and technology development centers fully or partly owned by academics

. Number of licensed patent/utility model/industrial design

(Aslan, 2014)

WHAT CAN BE DONE FOR THE UNIVERSITY TO BECOME AN ENTREPRENEURIAL UNIVERSITY?

Starting from the literature studied, namely the models built by Clark, Stevenson, Gibb, Brustureanu (2002), Scarlet (2003), Scarlet & Simion (2003), Scarlet & colab. (2005), Scarlet & Brustureanu, (2009, 2012), Scarlet, Brustureanu, Borangic, Popescu (2012), some relevant aspects that may come off on how modern universities should consider restructuring the university management to successfully complete the third mission are (Mihaela & Amalia, 2014):

- Transition from administrative management to entrepreneurial management, in which the university's strategy is oriented towards managerial and scientific opportunities regardless of the resources available at that time;
- Motivating the teaching and research staff to identify the scientific opportunities and support the development of entrepreneurial behavior at the university level;
- Create a professional environment for research and development excellence;
- Developing entrepreneurial culture as the foundation of competitiveness and prestige of the university;
- Initiating construction of internal and external informal networks progressive allocation of resources and sharing of resources with university stakeholders;
- Identifying research opportunities able to highlight the internal resources of the university and leading to local and regional economic development as a result of insertion of intellectual property in the industrial environment; □ Creating the necessary logistics for transferring academic research results to industrial environment.

CHALLENGES IN BECOMING AN ENTREPRENEURIAL UNIVERSITY

Universities face numerous challenges and obstacles on the journey to becoming more entrepreneurial, (for a detailed discussion see, for example, Clark, 1998; Etzkowitz, 2004; Thorpe and Goldstein, 2010; Gibb et al., 2012; Kweik, 2012), interalia (Hannon, 2013):

- Perceptions of relevance and meaning of entrepreneurship for higher education; and hence developing a shared institutional vision, identity and consensus;
- Organisational transformation and re-organisation of knowledge and people and opportunity;
- Ideological threats, notions of capitalist tendencies and the demise of academic autonomy through utilitarian approaches to modern university education;
- Curricula controls on content and assessment through internal structures, external agencies and professional bodies;
- Lack of academic career pathways for those pursuing entrepreneurships in higher education institutions, especially research-intensive institutions and hence perceptions of personal risk;

- Perceptions of weak academic rigor against other more established disciplines;
- Strong links with commercialisation and income generation rather than with education and learning;
- Positioning within an institutional structure either inside or outside of academic faculties or colleges and the associated flows of income and related kudos.

CONCLUSION

In the interest of quality of education and training as well as research it is necessary to change and advance universities to entrepreneurial universities. This is necessary in order to cope with the present and future challenges for universities (Schulte, 2014).

Deploying the triple helix model recently developed elsewhere an emergent entrepreneurial paradigm is outlined in which the university plays an enhanced role in technological innovation.

Governments encourage this academic transition as an economic development strategy that also reflects changes in the relationship between knowledge producers and users. It appears that the 'entrepreneurial university' is a global phenomenon (Etzkowitz, Webster, Gebhardt, & Terra, 2000).

Turning the traditional university into a more entrepreneurial one is the essence in role of embedding entrepreneurship education (Fayolle & Redford, 2014).

The entrepreneurial university model involves accepting the change in the functioning of mechanisms specific to university environment, the transition from traditional university with an administrative management to a modern, innovative and entrepreneurial one, with a new culture, the entrepreneurial culture. The awareness and acceptance of entrepreneurial spirit at the individual level and at the level of the entire functional system of the university, recognizing the importance of entrepreneurial culture are the first steps towards increasing the expected results through the assumed mission (Mihaela & Amalia, 2014).

In order to realize the entrepreneurial university concretely many organizational, structural and especially many behavioral changes are required. And changing of mentality and behavior is the most difficult challenge you could require from humans. But we need the concept of the Entrepreneurial University in order to secure academic freedom and a high level of quality of education and research (Schulte, 2014).

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