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ENTREPRENEURIAL UNIVERSITY: A KNOWLEDGE EXCHANGE PERSPECTIVE

PODUZETNIČKO SVEUČILIŠTE IZ PERSPEKTIVE RAZMJENE ZNANJA

ABSTRACT

Along the shift to a knowledge-based economy, universities around the world are under increasing pressure to transform themselves and develop different types of external relationships in order to exchange knowledge. The Triple Helix framework stresses the importance of trilateral and hybrid networks between universities, industry and government for the purpose of creation, use and exchange of knowledge and innovation. Since 2000 Croatian government has invested decisive efforts into founding a framework for university-industry cooperation and commercialization of research, but these efforts only slowly produce the expected results. This paper seeks to contribute to the growing body of literature on the Triple Helix Systems and entrepreneurial university by discussing the possibilities and examples of knowledge exchange and networking at a HEI which takes steps to enhance its potential for academic entrepreneurship. Based on the available faculty documents, as well as the results of interviews with faculty members, the study concludes that increasingly staff at the Faculty of Economics in Osijek engage in knowledge exchange and maintain cooperation with partners in industry and government. At the same time, it is important to observe that faculty opinions towards knowledge exchange and networking differ significantly.

Key words: entrepreneurial university, knowledge exchange, Triple Helix, academic entrepreneurship, innovation.

SAŽETAK

Istovremeno s prelaskom na gospodarstvo utemeljeno na znanju, sveučilišta diljem svijeta su pod sve većim pritiskom da se transformiraju i razvijaju različite vrste odnosa radi razmjene znanja. Triple Helix okvir naglašava važnost trilateralnih i hibridnih mreža između sveučilišta, industrije i vlade u svrhu stvaranja, uporabe i prijenosa znanja i inovacija. Od 2000. godine hrvatska Vlada ulaže odlučne napore u stvaranje okvira za suradnju između sveučilišta i industrije, kao i komercijalizaciju istraživanja, ali ti naponi vrlo sporo daju očekivane rezultate. Ovaj članak nastoji dopuniti postojeća saznanja o Triple Helix Systems i poduzetničkom sveučilištu raspravljajući o mogućnostima i primjerima razmjene znanja i umrežavanje na jednoj visokoškolskoj instituciji koje poduzima korake kako bi poboljšala svoj potencijal za akademsko poduzetništvo. Na temelju fakultetskih dokumenata, kao i rezultata intervjua s nastavnicima na fakultetu, može se zaključiti da osoblje na Ekonomskom fakultetu u Osijeku sve više sudjeluju u razmjeni znanja i održava veze s partnerima u industriji i vladi.

U isto vrijeme, važno je uočiti da se stavovi nastavnika na fakultetu u vezi razmjene znanja i umrežavanja značajno razlikuju.

Ključne riječi: *poduzetničko sveučilište, razmjena znanja, Triple Helix, akademsko poduzetništvo, inovacije.*

1. Introduction

Faced with the challenges of an insecure and complex environment and global incapacity to manage changes, as well as the prolonged financial crisis, and decline in core funding, universities are under increasing pressure to self-transform, and develop different types of external relationships in order to create, use and exchange knowledge and innovation. In such schemes, Croatian government has invested decisive efforts into founding a framework for university-industry cooperation and commercialization of research. Due to low scientific capacities, low R&D investments, absence of cutting edge technologies and the lack of strategic innovation management, these efforts only slowly produce the expected results (Švarc, 2014). Innovativeness and economic development in a knowledge based society advocate hybridization of university, industry and government in generating a new institutional and social framework for creation, exchange and implementation of knowledge (Ranga and Etzkowitz, 2013).

Although the Triple Helix Systems is not a recent invention, such form of cooperation is still in its early stages of development in Croatia. The significance of this approach to solving growing social and economic problems lies in the fact that such cooperation seems to be the only sustainable procedure to establishing a successful, productive and innovative society.

This paper seeks to contribute to the growing body of literature on Triple Helix Systems and entrepreneurial university by considering the significance of the Triple Helix Systems in a country in transition to knowledge-based society, in particular by calling attention to one feature of the Triple Helix Systems (relationships), and one particular aspect of it, namely the knowledge exchange relationships of faculty members and their attitudes towards knowledge exchange and networking. The lack of systematic research in this area means that there is a shortage of evidence about interesting and effective practices. Therefore, the paper discusses possibilities and examples of knowledge exchange relationships and networking at a HEI which is struggling to enhance its potential for academic entrepreneurship.

The paper is organized as follows: it starts by outlining the conceptual framework, drawing on the Triple Helix Systems literature. Next, the discussion about the transition to an entrepreneurial university is supported with the case of Faculty of Economics in Osijek, which is followed with the presentation of the results of a research and discussion of different knowledge exchange practices that members of the Faculty of Economics engage in. In addition, their opinion about the cooperation between university, industry and government is presented. The paper concludes with some implications of the research results and proposals for further research.

2. Triple helix systems and the future of university

The Triple Helix model focuses the attention on the cooperation between three sphere-institutions: university, industry and government, and postulates that the interaction among these spheres is the key to first improving the conditions for innovation in a knowledge-based society, and secondly sustaining economic growth. At the same time, it enables the measurement of the extent to which innovation has become systemic (Leydesdorff, 2012). This concept has since 1990s developed into a widely accepted framework which brings

together knowledge, consensus and innovations of three major social factors, thus providing a cradle for social and economic development, as well as general welfare (Etzkowitz, Leydesdorff, 2000). By bringing local-global (international-national) dimension as a fourth helix into the model (Leydesdorff, 2011), it has, since 2011, been extended to The Quadruple Helix.

Ranga and Etzkowitz (2013) synthesize key features of the Triple Helix model into an innovation system format as a set of Components (institutional spheres: university, industry and government), Relationships between components which contribute to the innovative policy, creation and management of economic growth (technology transfer, collaboration and conflict moderation, leadership, substitution and networking) and Functions (knowledge, innovations and consensus space). At present, the traditional roles of science, economy and government are being redefined. Besides carrying out its traditional role, each institutional sphere assumes roles of the other two (spheres), consequently directing its innovative potential into the creation of new innovations and knowledge. Hence, three spaces come into existence: Knowledge space which encompasses knowledge generation, its diffusion and use; Innovation space which includes formation and functioning of hybrid organizations that promote innovation; and Consensus space which incorporates formal and informal governance activities that bring together actors to brainstorm, discuss, and evaluate ideas and projects. In the initial phase, the circulation of knowledge between the three spheres of the Triple Helix is conducted individually. In the later steps, during the process of capitalization of knowledge, these connections become more complex and intense. In the final stage they represent a set of complex organizational connections among mutually overlapping spheres, thus gradually diminishing the boundaries that separate them.

Apart from its existing role in education and research, as a consequence of the second academic revolution (Etzkowitz, 2003), universities are encouraged to assume other roles and become more entrepreneurial. Modern universities educate students who carry new ideas, skills and entrepreneurial talent, which are the base values of the knowledge-based society. In addition to that, modern universities engage in generating technology, thus changing themselves from a traditional source of human resource to a source of new technology. Consequently, the emphasis from university, as a center of traditional teaching, has shifted to university becoming a socially responsible subject in social and economic development of a country.

The collaboration between the spheres (university, industry and government) faces serious challenges because each has its own characteristics, purposes and structures, and operate under different organizational environments and cultures, which have different norms, standards and values (Siegel et.al., 2003). With universities having different histories, traditions and structures, there is no typical way to become an entrepreneurial university.

3. Transition to an entrepreneurial university

Clark (1998) defined an entrepreneurial university as a university that actively seeks to work out a substantial shift in organizational character so as to arrive at a more promising posture for the future. Entrepreneurial universities provide a good environment, culture, opportunities and practices that enhance student entrepreneurship. The notion of entrepreneurial university is at the heart of the Triple Helix model and has been used in relation to a spectrum of evolutions faced in recent years by the academia (Looy et.al., 2003) : more involvement in economic and social development, more intense commercialization of research results, patent and licensing activities, the institutionalization of spin-off activities and managerial and attitudinal changes among faculty members with respect to collaborative projects with industry. Furthermore, researchers (Etzkowitz, 2004.) have framed the concept of the so-

called second academic revolution, which happened in the 1990s and includes the entrepreneurial objective as the third component to the mission of the university, along with research and education.

Etzkowitz et.al. (2008) argue that the emergence of the entrepreneurial university is the result of a complex interplay between exogenous and endogenous factors combined in different ways in different countries. Exogenous factors include socio-economic crises leading to loss of manufacturing industries and failure to create an alternative industry, movement of corporations and entrepreneurs abroad, followed by various government policy responses requiring universities to play a larger role in innovation. Endogenous factors include internal transformations within the university or other bottom-up organizational and management changes driven by changes in the intellectual property regime, as well as cuts in funding. At present, direct and indirect government measures stimulate economic growth by encouraging start-ups and Triple Helix interactions. Universities realize economic value from research, and are willing to participate in order to gain increased resources, additional streams of funding and sources of support, and simultaneously achieve their new academic objective of contributing to economic development and regional renewal.

Active involvement of various stakeholders is useful for successful entrepreneurial universities. Cooperation among university, industry and government spheres have received broader attention due to the recognition of the fundamental role of knowledge and innovation in fostering economic growth, technological performance and international competitiveness. These new relations are based on the concepts of scientific networks (Pavitt, 1997), and the new vision on university, industry, and government interactions as in the Triple Helix Systems. Through these relationships universities provide opportunities for their students and staff to take part in entrepreneurial activities in the external environment and thus create value for both the society and the university (Salem 2014).

A shift of priorities has been observed, favoring R&D that would contribute to productivity and global competitiveness, rather than to the development of new products in firms, as observed in Cohen and Noll (1994). The increased emphasis on knowledge exchange across university-industry boundaries has led to the creation and implementation of a variety of transfer-oriented mechanisms (Looy et.al., 2003), which include industrial liaison or technology transfer offices, academic spin-offs and joint ventures, science parks and business incubators.

Although the presence of a strong research potential is an important prerequisite for the transition to entrepreneurial university, it is not sufficient. (It is not rare in Europe that research-intensive universities display low levels of entrepreneurial activity.) On the other hand, low levels of university research and weak R&D potential of local firms are serious obstacles in this transition that can be extremely difficult to overcome, even with various government policies, programs and funding created to support technology transfer and entrepreneurship (Ranga and Etzkowitz, 2008).

Entrepreneurial universities have become a reality that cannot be ignored, and comprise three basic elements. First of all, a more prominent role for the university in innovation, secondly, a movement toward collaborative relationships among the three major institutional spheres, and finally, institutions assuming the roles of other two, while simultaneously performing their traditional function (Etzkowitz, 2008).

4. The case of Faculty of Economics

Faculty of Economics is a part of the J.J. Strossmayer University in Osijek, which relies heavily on government funding, and has suffered a significant loss of research funding. Teaching, research and entrepreneurship still present separate activities, but gradually these roles are being interlinked, and although the focus is still on teaching and research in the traditional sense, in the recent years, the Faculty has become a center of excellence in teaching and research on entrepreneurship, which has been documented in the results of teaching quality and research assessment, the research grants received, and the reputation of the Faculty. In 2008 the Faculty was granted the Chair in Entrepreneurship. Although relatively small, with little bit more than 50 faculty members, it has managed to gain a position among the leading universities in the region. In the recent years, Croatian government has tried to foster universities' involvement in knowledge exchange, and the Faculty of Economics has made efforts to enhance its entrepreneurial capacity. Most notably, it has engaged in fostering the development of different types of external relationships in order to exchange knowledge, including the establishment of Center for Entrepreneurship and BIOS, the most successful business incubator in the region.

In order to increase its competitiveness and employability of its students, as well as to ensure sustainable growth of the economy and contribute to the welfare of the whole society Faculty of Economics in Osijek has developed programs which are in demand. Križanović et.al. (2014) documented one such example, the A.C.T.I.V.E. project, whose aim has been to improve the employability of young people in the region. This project shows well how such cooperation can include agents from all three spheres: university, industry and government. Another successful example is the Legal-Economic Clinic (Delić, Oberman-Peterka, 2014), which presents a unique clinical-based training in two fields: law and business, and includes students and professors (as mentors) from Faculty of Law and Faculty of Economic of J.J. Strossmayer University in Osijek, as well as local lawyers and representatives of business support institutions. These examples show that at the Faculty of Economics knowledge is being distributed across boundaries of the three Triple Helix spheres.

As an example of transition to the entrepreneurial university form the perspective of knowledge exchange relationships two bottom-up practices will be presented here: first, one informal networking project, and then a formal spin-off.

Scholars have recognized the importance of networks as organizational structures which include relations that connect individuals and/or organizations. Networks can either be conceptualized as informal ties among individuals, or as formal contracts or strategic alliances. Literature has mainly dealt with formal interactions like patenting and licensing, research grants, collaborative research, consultancies and spin-offs, but less formal ones also deserve some attention. The example presented here is a networking project which was organized at Faculty of Economics by the students' organization EWoB during Global Entrepreneurship Week in 2014. Various workshops were organized on how to network, either face-to-face or through social media, and how to present oneself. The alumni and students who have succeeded, as well as professionals from IT companies, lobbying organizations, marketing agencies and business support institutions presented their experience and lessons learned. Participants at this event did not only get useful information, but established valuable contacts which have been reported to have resulted in work placements and employment, in addition to further cooperation of EWoB with similar organizations in the region.

Next, as an example of, a more formal knowledge exchange activity at Faculty of Economics in Osijek, a spin-off is presented here. As government cuts their funding, it is expected that universities will significantly increase their commercial activities, rather than reduce

expenses. University spin-offs represent a resource intensive way to exchange knowledge, with additional benefit of obtaining financial support for the host institution. Such cooperation spreads across all three Triple Helix spaces: knowledge, innovation and consensus. Spin-offs are in general virtual companies with low investment capital, sales and number of employees, but they draw upon research from the university and networks of researchers that come from several faculties of the university.

At the initiative of its students, Faculty of Economics is starting a spin-off, with the aim to enhance its own potential for academic entrepreneurship, and obtain additional funds, but also to train students in entrepreneurship and innovation, and increase their employability. This project has an additional function, i.e. to generate public awareness of the importance of knowledge and role of universities in handling pragmatic entrepreneurial issues. This particular example can be seen as a sign of students being trained for entrepreneurship and their taking entrepreneurial roles within and out of the university.

In short, the idea for the spin-off is that on-line marketing agencies transfer the inquiries about small budget, less demanding campaigns, that they are not interested in, to the spin-off where students carry out simple, less demanding campaigns under the supervision of their mentors. If, after that, a customer decides to invest more substantial funds into the next campaign, he is by contract referred back to the agency. All partners benefit from this: not only does the agency service and keep satisfied customers, but it also has the opportunity to train students and evaluate their engagement, as well as identify the most competent students as their future employees. The Faculty, as founder and the host institution, gets a percentage of profit, but also visibility in the community, in addition to getting access to a field where they can do their research, and real life examples which staff can use in their teaching. Finally, a spin-off is good for student because they can apply the new knowledge on solving real-life problems, get ready for the labor market while earning some pocket money.

The next section of the paper presents and discusses opinion of the faculty members concerning the cooperation among three Triple Helix spheres.

5. Methodology

The data for the research was collected by means of semi-structured in-depth interviews with 17 faculty members from all chairs. The interviewees were asked to discuss specific forms of knowledge exchange they have been engaged with, and to express their opinion about these practices. The interviews were coded by using character counts. The data was analyzed initially by exploring the research themes, and in greater depth at the second level of coding by developing sub-themes. The research was intended as an initial study to gain a deeper understanding of the scope of knowledge exchange practices and the opinions of faculty members concerning that at the Faculty of Economics in Osijek.

6. Results and discussion

Although one cannot be satisfied with the progress of knowledge exchange at Faculty of Economics, our results indicate that considerable number of faculty members engage in knowledge exchange processes with industry and government institutions, but our observations show that the way the faculty members engage in university-industry collaboration differs greatly.

The results demonstrate that faculty members communicate results of their research to firms and government institutions, and regularly present the results of their research to those who can make use of them. Although these practices do not include any commercial transactions and can actually be understood as core activities of faculty members, they presents an

important means of interaction with industry and government and may be seen as the first step leading to a more significant knowledge exchange. Business activities and commercialization of results are the practices adopted the least by faculty members. It has been observed that despite little involvement of faculty members in commercial activities, the number of such cases is growing.

A few interviewees have reported that they have been asked to participate in different working groups involved in the application of new knowledge and practices from their research. A large number have provided consultancy services to firms and/or government institutions. Cooperation between universities and industry goes very slowly, although faculty members are aware that universities are forced to react quickly in response to cuts in public funding. Few claim that the results of their research have contributed to development of new or improved goods or services. Several faculty members shared their experience that big corporations are reluctant to enter into such cooperation, while small and micro companies eagerly seek input for product development from the university. Faculty members tend to take part in consultancy, collaborative research and contract research, rather than in starting spin-off companies, or patenting and licensing. This can partly be explained with the characteristics of their core research topic. Also, there is a big difference between chairs in scope of such practices, which can also be explained with the character of their field of study and research. In conclusion, the most common knowledge exchange practices are presentation of research results and consultation. Besides, knowledge exchange relationships are conducted mostly individually, and the bottom-up approach is predominant. Moreover, it appears that most knowledge exchange occurs through informal relationships, and that external links that faculty members establish with industry and/or government do not seem to undermine cooperation with colleagues. On the contrary, it seems that the route to the entrepreneurial university encompasses the transition from individual to collective and organizational entrepreneurship, as individuals, in order to realize various projects, recruit collaborators with complementary skills. Those in favor of knowledge exchange additionally pointed out that through such cooperation researchers have an opportunity to prove they are, apart from being successful university teachers, successful businesspeople as well.

Secondly, concerning the cooperation of the university with government, it has been stated that government institutions in Croatia can hardly be considered entrepreneurial partners of Faculty of Economics, but they take part in the network and thus present a resource for the Faculty in terms of money, reputation and human capital.

In the second part of the interview, faculty members were asked to voice their opinion about these relationships. Differences with respect to the opinions of the faculty towards knowledge exchange can be observed. Interviewed faculty members are rather conservative regarding the entrepreneurial role of their home institution. At the same time, some faculty members show willingness to integrate the new role with their previous academic roles. Interestingly, faculty members with the least experience in knowledge exchange perceive the university-industry-government cooperation as mostly risky for fundamental academic values. They tend to believe that engaging in knowledge exchange relationships might result in academic research being influenced too much by the application-oriented needs of businesses. Also, it is the senior faculty members who seem to be more skeptical towards such practices, and more conservative about the university entrepreneurial role. Certain prejudices about the cooperation with industry and government can be found in the interviews. Faculty members also expressed concerns about certain drawbacks of university-industry-government cooperation. Apart from the most often mentioned shift towards applied research, most commonly expressed concerns are about the increased pressure on faculty members to spend too much time on commercial activities and the possible loss of interest and involvement of

faculty members in teaching. They also foresee the conflicts of commitment that occur when faculty members' full-time duties, which include teaching, tutorials with students, research and other obligations to the university, are affected by the activities from involvement in the cooperation. Often an opinion is voiced that offering public funds for research and formation of companies is not sufficient and that creation of VC industry is needed. Additionally, faculty members mentioned the need for change in standards for promotion and tenure, and the fact that the University does not have formal policies regarding and regulating this issue.

7. Conclusion

This paper presents evidence about the practices of knowledge exchange relationships among spheres of the Triple Helix at the Faculty of Economics in Osijek and their significance for the transition towards entrepreneurial university. It is a preliminary study, with a limited sample, but certain conclusions can be made, although without generalizations. The Triple Helix model emphasizes both opportunities and challenges arising from the involvement of the university in economic activities, and this has been supported by this research.

In conclusion, this study shows that transition towards entrepreneurial university at Faculty of Economics in Osijek has been gradual. In our example external knowledge relations start as informal, but evolve into a more formalized way of knowledge exchange leading to spin-offs. Furthermore, it has been shown that individual beliefs and behaviors are extremely important for knowledge exchange relationships to succeed. The analysis of perspectives of faculty members concerning knowledge exchange practices and cooperation of the faculty members with other two spheres could be understood as an important indicator of the present entrepreneurial behavior at the Faculty in the transition towards entrepreneurial university. Willingness of faculty members to participate actively in the process seems critical. Our examples indicate the importance of setting up incentives for the parties included, in order to ensure faculty collaboration.

Clearly, entrepreneurship at a university should not end with the capacity of one Faculty to spin-off new businesses in order to exploit its intellectual property or to attract additional sources of income, but it continues to faculty members becoming more innovative. For this purpose it would be appropriate to define what knowledge and skills faculty members have, which the university can commercialize on the market. Such relationships should be the test of the success of the faculty, as well as the competitiveness of its staff, and this could be the ultimate motivation for faculty members for getting involved in such practices.

“The entrepreneurial university is a public-private entity in scale and scope. In good time the private side predominates; in bad times the public side comes to the forefront. In all times, the global convergence to an entrepreneurial university is the reverse side of the same coin: the transmutation of academic knowledge into economic advantage” (Etzkowitz et.al., 2008)

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