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HIGHER EDUCATION IN SERBIA: EXPLORING A DEVELOPMENT MODEL OF THE THIRD MISSION AT AN UNIVERSITY

Abstract:

The role of universities has changed. Universities are not only focused on transferring knowledge and conducting research, but have become a link between the state and the economic environment. The new role of the university is referred to as its third mission through which the university becomes an institution that monitors development in society and actively is involved in solving its problems. In order to determine the appropriate development model of the third mission, at the University of Novi Sad (Serbia) was conducted survey on four levels: university - the Rector, faculties - dean, the department directors/heads of departments and staff. 200 employees at the University were surveyed, and the starting point for research was the questionnaire HE-Innovate tool, designed by the European Commission and Organisation for Economic Co-operation and Development (OECD). Research conducted at the University of Novi Sad presents empirical results of an entrepreneurial university in Serbia and indicates which are the key aspects of the strategic approach in the development of the University as an entrepreneurial university, as well as how to improve the quality of scientific research and educational work and therefore its internationalization.

Keywords:

the third mission, entrepreneurship, social role, internationalization, University of Novi Sad (Serbia)

JEL Classification: I25

INTRODUCTION

The main hypothesis of the paper is that the University of Novi Sad functions according to a model in which entrepreneurship is part of the development strategy of university. University encourages technology transfer and knowledge and working intensively on establishing a connection with the environment. In order to integrate all activities within the third mission and to confirm the basic hypothesis, the University of Novi Sad has initiated research of development model of the third mission, which involves testing on four levels: university - the rectorate, faculties - decanate, the department directors/heads of departments and staff. Key aspects of the strategic approach is the development of the University of Novi Sad, as well as entrepreneurial university and raise its competitiveness in terms of quality of scientific research and educational work, and therefore its internationalization.

LITERATURE REVIEW

The third mission of universities

The university was initially conceived as a teaching-only institution and later as a teaching and research institution, but since the Humboldtian reforms in Germany and the rise of the land grant universities in the USA (Altbach, 2008), universities have had a long history of working with government, industry and the wider society (Etzkowitz, 1998). The involvement of universities in the environmental, social and economic development and decision-making in the wider society, constitute the third mission of universities.

There is no single definition of the third mission of universities. According to Dan (2012), the third mission is the economic use of research, knowledge, intellectual property rights, patents, spin-offs, technology transfer and, in a broader sense, everything in the direction of society. Shore & McLauchlan (2012) highlighted that the third mission are activities geared towards knowledge transfer, forging links with industry and commercializing university research and teaching. The basic understanding derived from Molas-Gallart et al.'s (2002) framework is that the third mission is based on teaching and research missions and that it utilizes the knowledge capabilities and physical facilities of universities to serve society. The framework also shows that the third mission includes not only the commercialization of academic knowledge, patenting and licensing and creation of spin-off companies but also the contributions of universities to policy-making and social and cultural life (Ca, 2009; Krücken, Meier, & Müller, 2009). According to all of these definitions, the third mission includes intentional and direct creation, transfer, dissemination and utilization of the knowledge and/or other academic competences of a university for the benefit of the external communities as well as the involvement of the external communities in the activities of a university through ways that promote the mission of that university.

The engagement of universities with non-academic domains, particularly industry, is not a new phenomenon. According to Nedeva (2008, p. 92) "universities have been sensitive to

the needs of society and economy and even the more basic ‘understanding’ knowledge that they produce has often been informed by practical problems”.

The third mission represents a convergence of public interest and institutional self-interest and, therefore, offers a lot of benefits. A project or program implemented as part of a university-community partnership should produce direct benefits for the community. However, communities derive many additional and sometimes less obvious benefits from collaborating with a university (access to trusted academic expertise and knowledge, as well as the physical, financial and human resources of universities). Others include access to new ideas and learning (Beere et al., 2011). The third mission helps to address the knowledge and human capital needs of government, industry and society in general with the knowledge, human capital, intellectual property and infrastructural resources of universities. However, universities also benefit from the third mission. The benefits are both direct and indirect and are felt at different levels of the institution and by different institutional actors—students, staff, departments, centres, etc.—depending on the activities and their implementation.

University of Novi Sad (Serbia)

University of Novi Sad (UNS) is the second largest university in the Republic of Serbia, and also the largest and the only public university in the autonomous province of Vojvodina. During its 55 years of existence, the University and its faculties are continuously developed and today UNS has nearly 50,000 students and 5,000 employees in teaching and support processes (www.uns.ac.rs).

The last two decades make significant progress in promoting entrepreneurial culture at the University and its external ecosystem. The UNS was a significant pillar of enterprise development and management processes, production and service in them, through expert knowledge of their professors who advised the stakeholders in their business. Such experience is gained through cooperation with the industry and has a great contribution to the improvement of the other two main pillars on which the universities today are based: the improvement of the teaching process and better scientific research. This path of development has enabled the University of Novi Sad to make a step further and become the recognized high school institutions in the map of this part of Europe when it comes to support entrepreneurship and small and medium enterprises in the region.

Today UNS has over 100 enterprises that were established by the professors of the University. Also, the University is actively involved in the ongoing modernization of the teaching process in the field of entrepreneurship through a range of activities: the establishment of units in the field that studies entrepreneurship, organizing guest lectures by foreign and indigenous experts in the field, etc. This is supported by the fact that the UNS is actively participating in the establishment of numerous business entities (business incubators, business associations cluster, etc.), as well as a wide range of international projects aimed at supporting entrepreneurship, both for students and for participants from university environment and the region. Therefore, for the UNS is of great importance that constantly monitors development trends in the business entrepreneurs and companies from the environment and to constantly improve and expand external ties for the transfer of knowledge.

METHODOLOGY

The starting point in designing the questionnaire was HE-Innovate tool, developed by the European Commission and the Organization for Economic Co-operation and Development (OECD) (<https://heinnovate.eu/intranet/main/>), which is designed for self-assessment, but not for comparison between higher education institutions. The questionnaire consist statements with five-point Likert scale from 1 to 5, where it is not obliged to answer on all questions. The questionnaire can be used by individuals or groups of employees, students, stakeholders, etc. The questionnaire consist seven parts and has a total of 45 questions.

Research was conducted at four levels: university, faculty, department and employees. The questionnaire contains three types of questions: statements with scale for measuring the strength of attitudes; questions with answers and open questions. For the statements were used five-point Likert scale from 1 to 5, where 1 is "completely disagree" and 5 "strongly agree." Answers to the open questions will be used to better understanding the results.

The questionnaire consists 9 parts:

- **General information of respondents** - function, position, age, faculty and department.
- **Leadership and Management** - this part of the questionnaire examines those factors concerning the management of university/faculties, in connection with the development of an entrepreneurial culture. Apart from the fact that entrepreneurship is part of the mission of the institution, for the development of entrepreneurship is essential commitment of the management to its implementation. Also, the successful implementation of the strategy of development of entrepreneurship at the university depends on whether employees and students are familiar with it. The questions in this section point out those factors that are essential for the development of entrepreneurship.
- **The organizational capacities, people and incentives** - is a section which analyzes some of the key issues which the university/faculty should influence if it wants to minimize the organizational constraints in the implementation of the plan of entrepreneurship development. These include financial strategy, attracting and retaining entrepreneurial-minded individuals, and encouraging entrepreneurial behavior of individuals. All parts of the universities must work together on the development of entrepreneurship, creating a synergy between professors and students, among departments and faculties, through the establishment of new interdisciplinary connections in teaching and in research.
- **The development of entrepreneurship in teaching and learning** - for entrepreneurship development it is essential to teaching and training in the field of entrepreneurship are available to students and employees at the university and the wider community. In their implementation, in addition to professors from the universities, it should include successful entrepreneurs and representatives of stakeholders. This chapter deals with issues related to entrepreneurship training, and entrepreneurial approach in teaching.
- **Incentives for spin-out companies** - in order to be considered entrepreneurial

university, university must support entrepreneurial-oriented employees and students to implement their ideas. In addition to support in starting a business, it is necessary to work on motivating and spreading entrepreneurial mindsets. The questions in this section concern the measures implemented at the university/faculties with an aim to launch a larger number of companies by employees and students.

- **University-industry (external connection for the transfer of knowledge)** - University's full potential can be reached only by involving stakeholders from the public sector, businesses, professional associations, etc. This section covers topics connected with the relationship between university/faculties and stakeholders.
- **Entrepreneurial University as an international institution** - internationalization is one of the characteristics of entrepreneurial universities. This chapter deals with the influence of the international environment on the entrepreneurial aspect of learning, researching, development of entrepreneurial culture, etc.
- **Measuring the impact of entrepreneurial university** - this section deals with issues related to measuring the impact of activities being implemented on an entrepreneurial university. It can be measured by monitoring the number of students attending entrepreneurship courses, according to the revenues generated through co-operation with the economy, but above all, the number of established companies at the university.
- **The social function of universities** - an important part of the third mission of universities is a connection with the environment, through identifying and solving various social problems, education of the population as part of lifelong learning and the support of various initiatives, which are capable to contribute to the development of society as a whole.

Collection of the data from employees at the University was carried out electronically (by sending a questionnaire via e-mail). A cover letter explaining the purpose of research was attached to the questionnaire. 201 respondents (employees) sent back the questionnaires. Statistical Package for Social Sciences (SPSS) was used in order to perform statistical analysis at the level of each faculty, which will allow the results to be compared among faculties. Also, the results obtained in the whole university will enable its comparison with other universities in the country and abroad.

RESULTS AND DISCUSSION

In Table 1 are represented demographic data of 201 respondents by age and academic title.

Table 1. Demographic data of the respondents

Age	Percent	Academic title of the respondents	Percent
to 30	13%	Researcher	7%
31-40	39%	Assistant	27%
41-50	25%	Assistant professor	26%
Over 51	23%	Associate professor	17%
		Full professor	23%

Source: Data from the questionnaire

Faculties of the University of Novi Sad were represented as follows:

- Academy of Arts 0.5%,
- Faculty of Economics 9%,
- Faculty of Sport and Physical Education 6%,
- Faculty of Technical Sciences 20%,
- Faculty of Philosophy 2%,
- Faculty of Civil Engineering 0%,
- Faculty of Medicine 16%,
- Faculty of Education 8.5%,
- Faculty of Agriculture 5%,
- Faculty of Law 0%,
- Faculty of Sciences 25%,
- "Mihajlo Pupin" Technical Faculty 0.5%,
- Faculty of Technology 0.5%
- Teachers' Training Faculty in Hungarian 7%

Numerous changes in the environment cause changes such as changing the organization. Today universities operate in an environment that requires other approaches, ways of thinking and different structures. New ways of thinking means that people are in the first place, and universities must turn to human resources.

Various sources of funding are used in the realization of entrepreneurial goals at the departments - funds of faculties, departments, proceeds from the economy, the national, regional and local authorities and from abroad. According to the opinion of 31.8% of respondents, the funds of faculties are not represented in the realization of entrepreneurial goals, and 22.7% believe that they are represented at a medium scale. Own resources of departments are not represented in the realization of this kind of targets for the 40% of respondents. Almost half of respondents (45.5%) believe that the funds received from the economy are not represented at all in the realization of entrepreneurial goals. When it comes to the funds received from the administration, at least used resources are from the local administrative authorities (54.5%), while the funds of national and regional administrative bodies are widely represented for 27.3% and 31.8% of respondents. Funds from abroad by 50% of respondents were not represented as sources of financing to achieve entrepreneurial goals. The study results show that the faculties/ departments are still heavily reliant on funding from national and regional administrative bodies. In order to realization of entrepreneurial goals be sustainable, it is necessary to have different sources of financing, which would ensure greater success in business, and to provide opportunities for new projects and the training of employees.

That cooperation between professors and students contribute to the development of entrepreneurship for 59.1% of respondents, and faculties are willing to hire individuals who have an entrepreneurial attitude (31.8%). In the last ten years, only eight departments (36.4%) engaged individuals/institutions/organizations with entrepreneurial experience from Serbia and abroad in the segment of teaching (45.5%), and scientific research projects (63.6%). Although faculties are ready to engage individuals and organizations which have entrepreneurial experience, those in the previous period are not engaged in sufficient numbers which may negatively affect the achievement of the objectives of entrepreneurial faculty and internationalization.

Almost 90% of departments did not finance training in the field of entrepreneurship development, and as the most common reasons are lack of funding for training (50%) or lack of interest of employees (30%). Among other reasons are lack of time and interest, and largely focus on the teaching and research. A number of respondents considered that it is not their responsibility, but that it should be initiated by the management of the faculty.

A higher number of employees mostly disagree (22.5%) or completely disagree (19.1%) with the statement that faculties are investing in employees to support the development of entrepreneurship, and that there is no clear incentives and rewards for people who actively participate in the development of entrepreneurship at faculties. The research results show that in the opinion of the staff, faculties do not recognize the importance of investing in employee training in the field of entrepreneurship, nor assign means to encourage the employees to develop entrepreneurship. This fact can be discouraging and demotivating for employees, which may adversely affect the results of their work. That employees are interested in participating in the training program for entrepreneurship development shows a positive answer of 71.7% of respondents. This result shows that there is requisite for organizing various training in the field of entrepreneurship.

Over 50% of employees at faculties consider their faculty dedicated to cooperation and exchange of knowledge with the economy, society and the public sector. On the other hand, almost 45% of respondents believe that their college is actively establishing

partnerships in the field of entrepreneurship and cooperates with a number of external institutions. The answers to these two questions provide a clear indication that it is necessary for the University to work better on the continued support of its faculty in the field of display examples of good practice that is generated in all parts of the University of Novi Sad, but that is not sufficiently represented. Also, the University of Novi Sad should work on linking faculties, so that employees share mutual experiences that are different from faculty to faculty.

Almost 50% of respondents did not know whether their faculty cooperates with the economy or thoughts (over 10%) that there is no cooperation between universities and industry. Respondents who believe that there are certain forms of cooperation provide answers that can be classified into several categories: consulting services, collaboration on projects, organizing practice for students, service analysis, measurement and design, trainings, etc. Among the answers we can find formulations that employees know that there is some cooperation, but they do not know what kind of cooperation is concerned. This means that it is essential that faculties and University of Novi Sad constantly promote what kind of cooperation is concerned in order to engage employees in cooperation with the region.

Based on the survey results we can conclude that the basic issues on which we should work in the field of connection between university and industry is: improving the quality of teaching at the faculties, increasing the share of practical training in all subjects and increase the transfer of knowledge from the Faculty to the economy. A small number of professors have concrete cooperation with industry. The latest world trends show that more and more universities are turning to entrepreneurship. We should be looking at encouraging examples of world universities who have specialized services for the transfer of knowledge and technology within the University. It can be concluded that the current structure and system of knowledge transfer are not effective enough and fail to adequately meet the needs of dynamic technical and technological restructuring. Existing scientific organizations and educational institutions have relatively good quality staff but it is necessary to connect the creators of knowledge with end users, which is ignored at the University of Novi Sad.

Characteristics of the third mission of universities essentially depend on two main groups of factors: internal (the characteristics of the university as a social subsystem) and outside (the characteristics of the social environment). Given the fact that the contemporary Serbian society is still in the process of post-socialist transition, ie, that it is still burdened with numerous structural and functional problems, it is a need to strengthen the third mission of the universities. Based on the foregoing, one part of the study aimed to determine the characteristics of social entrepreneurship and employee participation in the University's activities.

The first step in analyzing the characteristics of social entrepreneurship at the University of Novi Sad was to determine employees' awareness of the existence of such activities. According to the survey, almost half (48%) of the total number of respondents believe that university staff perform public function and comply with those acts.

However, analysis of the data (Table 2.) shows that there is a strong positive statistical correlation between:

- the attitudes of respondents about the statement that faculty has a clearly defined strategy for the development and assertion of public activity of employees;
- the attitudes of respondents about the statement that entrepreneurship is a clearly defined part of the strategy of development of the Faculty, which confirms the practical importance of the strategic orientation of faculties/university for entrepreneurial action.

Table 2. Correlations of attitudes

		Faculty staff carries out a public social activity and behaves according it.	Our faculty has a clearly defined development strategy.	Entrepreneurship is a clearly defined part of the strategy of the Faculty.
Faculty staff carries out a public social activity and behaves according it.	Pearson Correlation	1	.468**	.411**
	Sig. (2-tailed)		.000	.000
	N	199	199	199
**. Correlation is significant at the 0.01 level (2-tailed).				

Source: Results of conducted research

Based on the research results, it can be concluded that:

- among employees at the University of Novi Sad there is awareness of the public university social function; it is an important precondition for their activism in the activities of social entrepreneurship,
- participation of employees in activities of social entrepreneurship varies depending on the faculty, as well as positions in the organizational structure of the university,
- there is insufficient knowledge of employees in specific activities that faculties have made in the field of social entrepreneurship.

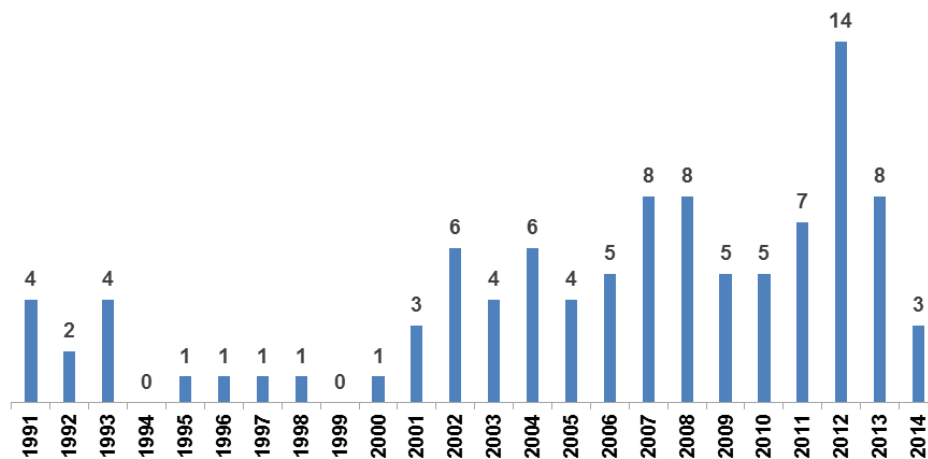
Research results suggest two courses of action to strengthen the social functions of the University of Novi Sad: improvement (primarily) of vertical communication (communication between different organizational levels of the university), as well as developing cooperation with NGOs. The first line refers to the improvement of communication top-down and bottom-up, creating functional and diverse communication channels. The second course of action involves strengthening partnerships through various forms of socially-oriented

activities: volunteering, public lectures, open libraries, projects aimed at tackling the (local) communities (in partnership with state institutions), cooperation with specific social groups, etc.

Entrepreneurship has not been compulsory part of the educational system in Serbia yet, although the Ministry of Education, Science and Technological Development, conducted certain activities on the approximation of educational programs to the real needs of the economy. Intensive cooperation with these companies has led to changes in the programs of study, and to the creation of new educational profiles. As a part of the ecosystem for supporting the development of entrepreneurship and innovation at the University of Novi Sad in 2004 was launched a national competition for the best technological innovation. As a preparation for the establishment of the Scientific and Technological Incubators, "Business Incubator Novi Sad" was established (for ICT companies and companies in the creative industries).

At the University of Novi Sad, 101 Spinout companies was established in the period from 1991 to mid-2014 (by the end of 2015 the number had risen to 115) (Figure 1). Most of these companies come from the Faculty of Technical Sciences. The average number of newly established companies from 5 companies, in early 2000s, rose to eight. It is expected that the establishment of NT park, both through providing successful models, and through the activities of the Business Incubator, which will be in its composition, will lead to an increase in the number of newly established companies to a level of 15 to 20 spin-off companies per year.

Figure 1. Number of start ups per year



Source: Internal data from the University of Novi Sad

Figure 2 shows the number of employees in Spinout companies. The growth trend is obvious and it is possible to predict the number of employees in the coming years. Number of employees in Spinout companies in the coming years depends on several factors. First of all, the opening of NT park, will lead to an increase in newly established ICT companies. On the other hand, universities are constantly increasing the number of students enrolled in studies in the field of ICT. As negative factors are negative population growth and emigration of young people abroad.

One part of the questionnaire was dealing with the internationalization through the mobility of professors, students and entrepreneurs, with a view to undertaking joint research, improvement of study programs, and a complete transformation of universities, which should be accompanied by changes occurring in the environment. Internationalization is one of the key parts of the entrepreneurial university, marked by the majority of respondents, which in the case of the faculties is 100%, in the management of departments 90.9%, while this percentage is lowest among employees, and 70.6%.

Faculties explicitly support the international mobility of staff and students according to the 100% of the surveyed faculty representatives and 70.6% of teachers and researchers. As a way of supporting mobility are provided assistance in applying, forwarding of useful information, exchange experiences with related faculties, collaborative projects, through the use of personal contacts through student exchange programs.

About the explicit support of the departments, positively voted 90.9% of the directors of departments and heads of departments. Among the universities surveyed, 83.3% of them said that they participate in international networks. As a way of support to mobility departments listed participation in international projects (such as Eureka, FP7, Horizon2020), membership in the programs of international mobility, through cooperation with other institutions of higher education, involvement of guest lecturers and attracting students from abroad, etc., noting that in addition to support Chair, the implementation itself depends on the initiative of individuals, and that it must not undermine the regular work process.

International mobility of students by the majority of respondents on the faculties is designated as a growing, where most worked out in the EU countries in the region (66%) and other EU Member States (16%), while the international mobility of teaching and scientific staff in 50% of the questionnaires marked as stagnant, and 33% as growing. Among those surveyed, with the department of student mobility was 59.1% termed as growing 13.6% as stagnant or declining, while 27.3% had no information about this. Asked which countries are leaving the students, 40.9% of representatives of the department and the department did not have information, while 45.4% as a destination led EU countries.

Of the surveyed employees, 27.2% said that they participated in the programs of international mobility, thereby it came to the following programs: study visits to other universities, stays at other universities as guest, participation in international conferences and publications in international scientific conference, through bilateral cooperation through the participation in international projects (JOIN EU-SEE, TEMPUS, COST, Erasmus +, FP7, H2020, IPA, Erasmus Mundus), participation in summer schools and etc.

CONCLUSIONS

The results will enable to develop a model of the third mission in the form of scientific research studies about the necessary changes in scientific research and educational processes at the University of Novi Sad. It will be determined the coordinator of the activities of the third mission with the task of mapping the most important partners from the public and private sectors with which there has been no official cooperation.

The results will give a concrete contribution to the management of institutional policy to

promote research and teaching at the University of Novi Sad, in line with the strategies of scientific and technological development of Vojvodina and the Republic of Serbia. Ensuring and improving the quality of scientific research and educational process, encouraging the development of entrepreneurship, as well as significant cooperation between the university and industry and society in general should contribute to the transfer of technology and knowledge, as well as increasing the visibility and better positioning of the University of Novi Sad in Europe. In addition to this, improving the functionality of the third mission of the University should contribute to the strengthening of the single educational space, as well as adequate financial and administrative support for the implementation of major international research projects and partnerships. The model used in the research at the University of Novi Sad could serve as a basis for implementing the same survey at other universities in the Republic of Serbia.

REFERENCES

- ALTBACH, P. G. (2008) The complex role of universities in the period of globalization. In Global University Network for Innovation (GUNI), *Higher education in the world 3: Higher education: New challenges and emerging roles for human and social development* (pp. 5–14). London: Palgrave Macmillan.
- BEERE, C. A.; VOTRUBA, J. C. and WELLS, G. W. (2011) *Becoming an engaged campus: A practical guide for institutionalizing public engagement*. San Francisco, CA: Jossey-Bass Publishers.
- CA, T. N. (2009) Reaching out to society: Vietnamese universities in transition. *Science and Public Policy*, 2009, Vol. 36, No. 2, pp. 91–95.
- DAN, M. C. (2012) The third mission of universities in the development strategy of Vienna city. *Informatica Economica*, 2012, Vol. 16, No. 4, pp. 49–56.
- ETZKOWITZ, H. (1998) The norms of entrepreneurial science: Cognitive effects of the new university–industry linkages. *Research Policy*, 1998, Vol. 27, No. 8, pp. 823–833.
- KRÜCKEN, G.; MEIER, F. and MÜLLER, A. (2009) Linkages to the civil society as ‘leisure time activities’? Experiences at a German university. *Science and Public Policy*, 2009, Vol. 36, No. 2, pp. 139–144.
- MOLAS-GALLART, J.; SALTER, A.; PATEL, P.; SCOTT, A. and DURAN, X. (2002) *Measuring third stream activities: Final report to the Russell Group of Universities*. SPRU, University of Sussex.
- NEDEVA M. (2008) New tricks and old dogs? The ‘third mission’ and the re-production of the university. In D. Epstein, R. Boden, R. Deem, F. Rizvi, & S. Wright (Eds.), *Geographies of knowledge, geometries of power: Framing the future of higher education* (pp. 85–103). New York: Routledge.
- SHORE, C. and MCLAUCHLAN, L. (2012) Third mission activities, commercialisation and academic entrepreneurs. *Social Anthropology/Anthropologie Sociale*, 2012, Vol. 20, No. 3, pp. 267–286.
- <https://heinnovate.eu/intranet/main/> (Accessed on the 15th May 2015)
- <https://www.uns.ac.rs> (Accessed on the 20th May 2015)