

ECONOMIC KNOWLEDGE OPTIMIZATION IN UKRAINIAN AGRARIAN UNIVERSITIES: A KNOWLEDGE MANAGEMENT PERSPECTIVE

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Abstract: *A university as knowledge-intensive organization is an important actor that has a powerful influence on knowledge-economy formation. Implementation of knowledge management in universities is inevitable by-product of economic growth and improvements in diverse branches of national industry complex. The aim of this paper is to analyze the economic knowledge functioning in Ukrainian agrarian universities. The author uses statistical analysis to measure the number of economic departments and academic disciplines in Ukrainian agrarian universities. The study shows that up to 37,5% of educational departments in Ukrainian agrarian universities consists of economic educational departments. The analysis of economic knowledge functioning in Vinnytsia National Agrarian University showed that within economic educational departments almost 55% belong solely to economic disciplines and almost 30% belong to interdisciplinary economic courses. The author also uses theoretical modeling to show the knowledge environment of the universities. Attention is focused on differentiation between the inner, micro and macro knowledge environments of the universities. The author strongly recommends the use of knowledge management instruments with the aim of improving economic knowledge. Improvement of knowledge flows between an agrarian university and other important stakeholders will allow the optimization of the knowledge infrastructure of the universities, including the structure of economic knowledge. Government bodies, managers of the universities, and heads of university departments should use knowledge management tools on the systemic basis in order to achieve significant organizational results and make progress. Universities should take into consideration the specificity of micro and macro environments. Factors of globalization, new technologies, politics and legislation, economics and finances, society and culture, nature and geography should be examined and included in the information infrastructure of a university. It is clear that macro environment information is already under the consideration of academic governing bodies.*

Keywords: knowledge management; knowledge environment; knowledge-intensive organizations; agrarian university; interdisciplinarity.

JEL classification: A12, I20, Q19.

1. Introduction

During last two decades, knowledge management (KM) established itself as a reliable instrument that allows the enhance of the effectiveness of knowledge usage on multiple levels. Business organizations as well as non-commercial and government organizations try to implement KM and optimize their knowledge infrastructure. Application of KM in universities can help solve numerous problems associated with sustainable development in the XXI century. Implementation of sustainable development principles is strongly associated with the dominant role of universities in the development processes (Fam, 2017; Ismail, Welch and Xu, 2015).

Literature related to the KM implementation in a university environment is quite broad and diverse. One of the most important areas belongs to the regional development by means of KM in universities (Corsi and Prencipe, 2018; Di Nauta et al., 2018; Hermans and Castiaux, 2017; Rodríguez-Gulías, Rodeiro-Pazos and Fernández-López, 2016). Using a cross-disciplinary cooperation between a university and other stakeholders, a society can achieve considerable improvements resulting in various areas of regional development.

KM covers almost every part of a university's activities. Employability (Frunzaru et al., 2018) and knowledge transfer between a university and industry (Rodríguez-Gómez and Gairín, 2015) still remain one of the most crucial problems connected to KM. Undoubtedly, these spheres are important for the proper functioning of a university. But, within the scope of the article, we focus our attention on the peculiarities of economic knowledge in Ukrainian agrarian universities.

Usage of KM in universities with the aim of economic knowledge optimization will help reveal the full potential of research and development (R&D) and learning. We use statistical analysis of economic knowledge that flows within agrarian universities. We also propose a theoretical model that helps improve economic knowledge and academic activities associated with it.

2. Literature review

Scientists and scholars all over the world have a positive attitude towards the implementation of KM in universities. During the last decade, a lot of information about the positive aspects of KM has occurred. Scientists concluded that KM has an exceptional potential in the educational sphere (Mohammad and Jose, 2016). KM can bring a lot of fruitful results connected with innovation creation. Since universities are knowledge-intensive organizations, a lot of knowledge must be organized in an appropriate way (Oliveira et al., 2006). Some scientists also connect the implementation of KM in universities with the processes associated to globalization, emerging technologies and organizational competitiveness (Al-Zoubi, 2014). KM can advance the level of academic excellence, and it also helps to create necessary conditions for knowledge exchange and transfer, which will help to achieve economic goals (Ramanigopal, 2012).

Universities must know their knowledge assets in order to gain maximum profit. Very often, academic knowledge exists in the form of "gray literature", but optimization of knowledge can turn it into real treasure (Dhamdhere, 2015; Downs and Velamuri, 2018). In order to be competitive in a knowledge society, universities should create knowledge not only for their own use (Bureš et al., 2011). KM allows the full use of knowledge, which is in the possession of universities (King, 2009). Universities should build an information infrastructure and thus become an integrated part of a knowledge society (Hoq and Akter, 2012). Scientists expect that KM implementation will help a university become a trigger of innovations and a productive part of a knowledge economy (Ojo, 2016). Universities must consider large amounts of knowledge that can be obtained from outside of a university (Akram et al., 2011), but all the components of KM must be carefully carefully (Ngok-Tan and Gregar, 2018).

Scientists associate KM with an optimization of university information infrastructure and human resource management of academic personnel. KM can also influence the improvement of the learning and teaching processes (Mohavidin et al., 2007). In this respect, it is important to find connections between faculties' development and personal KM (Ççavuşoğlu and Uzunboylu, 2014). KM can have a great influence on the development of creative skill among university staff (Rahimi et al., 2011). In the university environment, KM can be used as an alternative strategy for faculties' support and improvement of work (Mazhar and Akhtar, 2016).

Since knowledge is a complex concept, academics have to deal with large amounts of data, which can be converted into information, if the appropriate context can be understood (Kidwell, Linde and Johnson, 2000). To do this, scientist create step-by-step plans of KM implementation in universities (Agarwal and Marouf, 2014). A lot of advantages can be created, so that managers and academics must consider growing competitiveness and reduction of government spending (Chaston, 2012). Apart from this, modern conditions create situations where technological culture must be supported with informational culture. In general, KM can help with the optimizing of processes that are connected with effective information usage in universities.

We must mention here that a university, as a knowledge-intensive organization, should use both general KM tools and specific KM tools associated with university specific activities. The first group includes problems of knowledge governance and knowledge infrastructure creation (Sohrabi et al., 2015), factors of KM success (Al-Oqaily, Hassan, Rashid and Al-Sulami, 2014), cycles of knowledge and multiple knowledge trajectories (Pantic-Dragisic and Söderlund, 2018; Barley, Treem and Kuhn, 2017). The second group includes questions of interdisciplinary knowledge integration (Mengis, Nicolini and Swan, 2018; Shaw et al., 2018), teamwork building, advance of team creativity, elimination of hidden knowledge (Teodoridis, 2018; Fong et al., 2018) and development of academic personnel (Darvish, Ahmadnia and Oryshyan, 2013; Mannucci and Yong, 2018).

3. Aim and methodology

The aim of this paper was to analyze the economic knowledge functioning in Ukrainian agrarian universities. Since agrarian business uses knowledge both from agrarian science and also from economic sciences, it is important to analyze the amount of interdisciplinary courses in a university.

We use statistical analysis in order to investigate the peculiarities of economic knowledge functioning in Ukrainian agrarian universities. Within the article, our attention is focused on two main elements, which we define as follows: quantity of economic educational departments in the universities and quantity of academic disciplines that are related to economic knowledge. Information regarding the percent of specialized, economic and interdisciplinary knowledge will help reveal the structure of economic knowledge functioning in the agrarian universities.

We have selected 13 universities out of 240 Ukrainian universities from Universities Rating "TOP 200 Ukraine" 2018 (Osvita, 2018), that are connected to agrarian science and education. The attention was focused on the actual quantity of economic (or partly economic) departments at the agrarian universities. The next step was to analyze the amount of economic disciplines and interdisciplinary courses at one of the Ukrainian agrarian universities. This information will help reveal the level of integration between economics and agrarian science in Ukraine. With that aim in mind, we have analyzed a list of educational disciplines that are taught at the economic faculties of an agrarian university. In both, cases descriptive statistical analysis was used.

We have also used theoretical modeling to visualize complex processes related to the creation, storage and exchange of knowledge. We have employed the use of theory of the marketing environment as the basis for the offered conceptual model. Thus, modulation of the theory is grounded in the concepts of inner, micro and macro knowledge environments. Every environment (out of the three mentioned environments) has elements and also flows of information between them. The effective implementation of KM in an inner environment is directly linked to the ability of productive communication with external environments.

4. Results

The development of the agrarian sector in Ukraine greatly depends on the theoretical work with information that is related to situation in the agrarian sphere. In the 21st century, the development of the agrarian sector is connected to the economic effectiveness of enterprises that form regional markets and the national agrarian infrastructure. At university level, integration between economics and agrarian sciences exist in the form of academic disciplines and R&D of detached departments.

Managers, scientists and academicians should pay serious attention to problems of KM implementation. Modern development of technologies allows the management of huge quantities of data and information. We decided to analyze the functioning of economic knowledge in Ukrainian agrarian universities, in order to study the abilities of interdisciplinary activities' improvement.

We have chosen thirteen Ukrainian agrarian universities from the rating of top Ukrainian universities. They constitute the network where knowledge is necessary for when the agrarian sector is cultivated. Since the agrarian domain is part of the national economic system, then an economic component of education in Ukrainian agrarian universities plays an important role in the education of future agrarian specialists. Each of the thirteen Ukrainian agrarian universities have economic faculties, where economic knowledge is distributed. The faculties are divided into educational departments that concern themselves to specific economic themes and issues.

Table 1: Number of economic educational departments in Ukrainian agrarian universities

Universities	Rating	Faculties	Departments	Econ Departments	% of Econ Departments
National University of Life and Environmental Sciences of Ukraine	22	16	105	19	18,1
Sumy National Agrarian University	129	8	53	9	17,0
Mykolayiv National Agrarian University	133-134	8	27	8	29,6
Dnipro State Agrarian and Economic University	142-143	7	37	6	16,2
Bila Tserkva National Agrarian University	147-149	6	43	6	14,0
Vinnytsia National Agrarian University	152-153	6	32	12	37,5
Poltava State Agrarian Academy	154	7	33	8	24,2
Tavria State Agrotechnological University	155	6	28	7	25,0
Kharkiv National Agrarian University	161-162	6	32	8	25,0
Zhytomyr National Agrarian and Ecological University	171	8	41	10	24,4
Lviv National Agrarian University	172-173	5	35	6	17,1
Kherson National Agrarian University	181-183	5	20	6	30,0
Odesa National Agrarian University	216	3	20	3	15,0
Average		6	33	7	22,9

Source: Author's elaboration based on Universities Rating "TOP 200 Ukraine" 2018 (Osvita, 2018).

In general, a great part of a university's' educational activity depends on economics-related knowledge and economics-related education. Economic knowledge exists in the form of specialized economic disciplines or interdisciplinary courses (we will discuss them later). It is analyzed that Ukrainian agrarian universities contain from 20 to 105 educational departments. A significant number of departments, from 15 to 38%, are related to economics. The smallest amount of solely economic departments is in the Odesa National Agrarian University (3 departments), and the biggest amount is in the Vinnytsia National Agrarian University (12 departments). Thousands of teachers and scientists work and create economic knowledge within these departments. Generally, they work on the creation and improvement of academic disciplines and working programs. Each department also has a program of specific R&D related to economics, marketing, management etc.

The amount of economic educational departments is quite big and knowledge that is created within them brings serious positive effects to agrarian sphere. Many interdisciplinary courses and solely economic disciplines exist in different variations and reflect specifics of separate university and academic personnel. Economic disciplines, from economic theory, to marketing, accounting and management, create a holistic understanding of economic phenomena and teach students to be aware of economic processes.

Undoubtedly, within the borders of the country, agrarian universities are competitors, but they may also cooperate to advance the quality of knowledge and education as a nationwide phenomenon. The systematization of knowledge that belongs to agrarian sphere requires a lot of time, proper governance and resources. Interdisciplinary knowledge that is associated with economics constitutes an important part of the modern agrarian discourse. We can firmly state that the spreading of information technologies (IT) makes a great input in knowledge optimization. Even universities that are situated in different regions of the country can become subject of and to scientific research, directed towards KM and knowledge quality improvement.

Until the universities preserve big amounts of scientific knowledge only for their own usage, we will not be able to make judgements about competitiveness of knowledge, especially at national levels. Openness and transparency of information systems in the universities are a pledge of different aspects of education and science comparison. Unfortunately, many Ukrainian universities still do not have open access to information regarding quality and quantity of academic disciplines working programs that are taught within educational departments. Openness of knowledge that is related to educational process is a complex global problem as it is related to the systematization and standardization of university knowledge.

In order to explain the circulation of economic discourse in agrarian universities we have conducted the analysis of educational disciplines and courses that are being taught at the educational departments of Vinnytsia National Agrarian University (VNAU). The number of economics-related educational departments in VNAU is the highest among analyzed universities, so we can assume that the university has a profound system of economic knowledge.

Three faculties were chosen for the analysis. The faculties are split into twelve educational departments that specialize in economics, marketing, management and accounting. Each educational department has a diverse number of educational disciplines. The minimal quantity of disciplines is 13 and the maximum is 54. In general, 344 academic disciplines were analyzed, out of which 189 are solely economic disciplines and 102 have interdisciplinary character. The department of economic cybernetics does not have general economic disciplines, but almost half of its disciplines have strong interdisciplinary orientation that is related to the economics. Academic disciplines on other departments can refer only to economic and interdisciplinary knowledge, for example Department of Economics.

Table 2: Number of economic and interdisciplinary courses in Vinnytsia National Agrarian University

Departments	Discip lines	Econ Discip lines	Interdis- ciplinary courses	% of Econ Discip lines	% of Interdis ciplinary courses
Department of Economic Cybernetics	29	0	14	0,0	48,3
Department of Economics	43	30	11	69,8	25,6
Department of Foreign Economic Activity Management, Hotels and Tourism	54	14	24	25,9	44,4
Department of Modeling and IT in Economics	32	10	16	31,3	50,0
Department of Finance, Banking and Insurance	34	30	3	88,2	8,8
Department of Agrarian Management	26	18	7	69,2	26,9
Department Administrative Management and Alternative Energy Sources	36	21	5	58,3	13,9
Department of Marketing and Agrarian Business	27	12	14	44,4	51,9
Department of analysis and statistics	14	13	1	92,9	7,1
Department of Audit and State Control	14	12	2	85,7	14,3
Department of Accounting	13	10	2	76,9	15,4
Department of Accounting and Taxation in the Branches of Economy	22	19	3	86,4	13,6
Total	344	189	102	54,9	29,7

Source: Author's elaboration based on based on the Lists of disciplines that are taught at the economic faculties of VNAU (Vinnytsia National Agrarian University, 2019).

Quantity of solely economic disciplines is almost 93%. Although the amount of economic disciplines in overall amount of academic disciplines is pretty high, managers and academics should draw attention to the interdisciplinary courses that combine knowledge from economics and other sciences. For example, the Department of Modeling and Information Technologies in Economics have 50% of interdisciplinary courses. That means the many complex interdisciplinary questions may occur, since in agrarian universities we can find a mix of theories and practical knowledge from computer sciences, economics and agrarian sciences. An observer can find high levels of interdisciplinary complexity within the agrarian universities. Still, some educational departments can have only one interdisciplinary course. The understanding of interdisciplinary connections between academic disciplines is a complex task. On one hand, we have a strong demand for economic disciplines that help to understand economic laws and conduct of agrarian business. On the other hand, students need to know practical and technological aspects of agrarian business (for example, technologies of growing plants and crops). Overall information that exists on the crossroads between economics and agrarian sciences is very big in volume. That is why we need to

consider the complexity of an information system and the complexity of a university as it's part.

For the convenience of the research, we have created the model of knowledge environment of a modern university. We took the model of marketing environment of the organization as the basis. Since universities are knowledge-intensive organizations, then between universities and other stakeholders a lot of information flows exist, flows that provide information exchange between the parties. Facilitation of information reciprocation will help to optimize the information structure of a university and rise the quality of the educational process. A university is also an important part of the knowledge economy and it takes part in the processes, transformation and betterment of the Ukrainian society.

Figure 1 shows the inner, micro and macro environment of a university. Microenvironment includes state organizations, business representatives, civil society, other universities and foreign organizations. All these stakeholders actively cooperate with a university as a knowledge-intensive organization and are involved in the processes of creation, storage and exchange of information. Facilitation and organization of the cooperation between a university and other involved parties will create new information flows and clarify existing data. Such cooperation, first of all, can affect the quality of scientific and educational activities in a university. Stakeholders can take serious part in university's events and coaching support. Establishment of new information flows can show new directions for managers and academics' development that will bring a new understanding of existing problems.

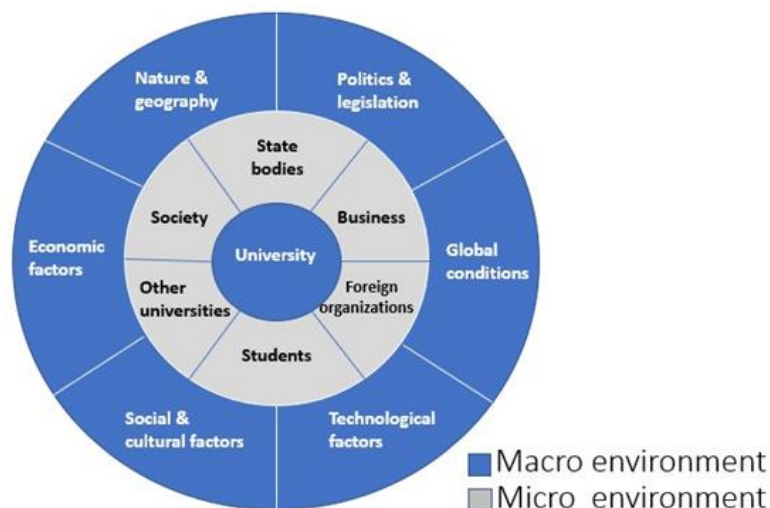


Figure 1: Inner, micro and macro knowledge environments of Ukrainian agrarian universities
Source: own elaboration

The macroenvironment influences all analyzed universities. The understanding of the macroenvironment and the adaptation to macroconditions require KM instruments in order to manage information flows and conduct reasonable changes. One of the main problems is improvement of research and teaching quality, which will help to raise competitiveness of national universities. Other important problems are the standardization of knowledge, the search of proper standards or even possibility of standardization. Other macro-factors can influence the development of information infrastructure from the outside of a university. That is why the influence of political, economic, technological and social factors must be measured and controlled.

By considering the agrarian university as an element of the knowledge economy and the most important player in the appropriate region requires intensified attention from government bodies, managers of the universities, business representatives and other bodies involved.

5. Discussion of the results

The creation of holistic view about the role and place of a university in the knowledge society and knowledge economy depends on the possibilities of considering all the important factors. With this purpose, we have made some advice for university managers and decision makers. Attention and efforts should be concentrated around implementation of KM principles in a university inner environment. It will help to optimize, arrange and regulate internal flows of information. Improvement of inner knowledge environment depend on optimization of hundreds of academic disciplines and interdisciplinary courses. Attention should also be paid to the reconsideration of R&D programs of some university departments. The applying KM principles to the inner environment of a university can bring a higher quality of creation, storage, distribution and exchange of information. Exceptional attention should be paid to the clarification, openness and accountability of information in a university.

An effective internal knowledge and information management is strongly bounded to the micro and macro knowledge environments, that are situated outside a university, but that have a powerful influence on university life. On a regional level, universities actively cooperate with local government bodies, business representatives and the civil society. Besides this, students take part in international academic programs that are provided by foreign organizations. Exploitation of KM provides efficient instruments for the improvement of information flows between universities and microenvironment. The distribution and exchange of knowledge can be more effective when the importance of KM is realized. KM can be supported with good governance and human resource management tools.

Proper organization of information flows around a university (in our case agrarian university) will improve the national network of university education and science. Thus, agrarian universities form a national network of higher education institutions that specialize on research in agrarian sector and preparation of the professionals this particular sector. From an economic point of view, universities are competitors. But from the public administration point of view, universities are part of a higher education that support the functioning of the agrarian sector of the economy. Therefore, the state is directly interested in the advancement of the national agrarian science and education. This is completely consistent with the strengthening of a university role as being the trigger of innovation in the regions (where universities are situated). In this dimension, problems of systematization and standardization of knowledge, especially economic, deserve special attention. Other crucial problems are optimization, practical character and quality improvement of data, information and knowledge.

By considering an agrarian university as an element of the knowledge economy and the most important player in a region requires an intensified attention from all the involved parties.

6. Conclusions

By applying the theoretical model described in the paper can have a sporadic or systemic character. By forming a developed knowledge economy requires active support of regulated information flow from universities. The excellence of academic staff is strongly connected with the quality of educational programs and academic disciplines. Partly, this depends on the optimization of economic knowledge in universities.

We can conclude that economic knowledge exists in the form of solely economic disciplines and disciplines that contain economic knowledge and which have an interdisciplinary character. While economic knowledge constitutes an important part of the education of students, interdisciplinary courses can facilitate practical training and explain connections that exist between economics and agrarian sciences.

KM instruments that are in possession of universities allow universities to fully use the potential of knowledge and improve the quality of information flows. To do this, first and foremost, university managers, faculties members and faculties should use KM literature and organize university activities according to theoretical recommendations and principles of KM.

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Bio-note

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