

The Analysis of Factors Involved in Assessing of University Scientific Research

Cristian Marius Toma,

„Grigore T. Popa" University of Medicine and Pharmacy Iasi, Department of Research Projects Management, Iasi, Romania

„Alexandru Ioan Cuza" University Iasi, Doctoral School of Economics, Iasi, Romania
tomamariuscristian@yahoo.com

Carmen Luiza Costuleanu,

"Ion Ionescu de la Brad" University of Agricultural Sciences and Veterinary Medicine of Iasi

Faculty of Agriculture, Agronomy Department, Iasi, Romania

ccostuleanu@yahoo.com

Vasilica Toma,

„Grigore T. Popa" University of Medicine and Pharmacy Iasi, Faculty of Dental Medicine, Iasi, Romania

vasilicatoma40@yahoo.com

Abstract

Universities have an important role in the development of knowledge-based society through the contribution in knowledge production, transmission, dissemination and utilization. Universities are called to develop scientific research programs oriented to new directions and priorities in science.

University scientific research represents, through its impact on the development of knowledge and human resources, one of the essential pillar of socio-economical development. The growth of innovation capacity, valorization of teaching staff and students' creative capacity by the transfer of knowledge, products and technologies to the economical environment, represent one of the determinant factors of universities' socio-economic role.

This work presents the results of a study in which we have analyzed the factors that were involved in assessing the university scientific research, and the importance of these factors. In this study participated university teaching staff from the "Grigore T. Popa" University of Medicine and Pharmacy from Iassy.

Key words: universities, university scientific research, analysis, factors, assessment

J.E.L. classification: I 23

1. Introduction

It is unanimously accepted that the development level of a society is determined by its educational system, the instruction level of its citizens. The more educated are the citizens of a country, the more able will they be to decide on the future of the society in which they live and develop themselves.

The universities have been deeply modified during the last 50 years. They have suffered several mutations, being converted from elite institutions in leading actors within knowledge-based society. They play three inter-connected roles: knowledge-based production, mainly through research, knowledge transfer through education and instruction, and knowledge dissemination and application through innovation (OECD, 2010).

Universities play a unique role in the development of the knowledge-based society, through the contribution brought to the knowledge production, transmission, dissemination and utilization. The essential role of the university is to form highly qualified human resource, a process that implies a

symbiosis between education and research, the performance of the educational system contributing largely to society development. Well-trained human resource represents an important wealthiness of a nation.

Sustainable success elements of the universities explain why, in the world of globalization, universities are now considered as important national assets. Worldwide governs see them as vital resources of new knowledge and innovative thinking, as suppliers of qualified personnel and credible accreditations, as well as contributors to innovation, attracting talents and international investments in a region, as agents of social justice and mobility, contributing also to culture and social vitality (Boulton and Lucas, 2008).

In the USA, the research universities are vital centers for research performance that advances knowledge from all scientific and engineering disciplines, contributing to the national, regional and local economies. Thus, one of the basic missions of the research universities is that of sites for basic research whose results are published in open specialized literature, the results of the basic university research having to maintain and refill the "pool" of knowledge which industry can draw up (Atkinson and Blanpied, 2008).

The universities have converted themselves in organizations with several goals, which evolves in a more and more complex national and international context, still having an important role at local, regional and national level. The collaboration with the industry and the application of research results have brought additional profits to universities, they being thus able to complete the public financing from national (governmental funds) and regional authorities.

1.1. University scientific research

According to Zait and Spalanzani (2006), the scientific research represents a systematic, structured and coherent quest, based on specific and specialized coding systems and an adequate methodology, in order to find what will become novelty, innovation, invention or discovery. The authors specify that the scientific research is defined in the knowledge theory and epistemology as a logic demarche for finding explanations through systematic formulation and testing of some utterance and utterance systems, and the construction, reconstruction, consolidation or development of the theory on whose basis and within which it is realized. Zait and Spalanzani (2006) also add that within the empiric sciences, the scientific research is permanently reporting to facts, events or relations that are part of natural reality and, therefore, it formulates hypotheses, builds theoretical systems and confront these systems with natural reality, with experience, through observation and experiment.

University scientific research represents, through its impact on the development of knowledge and human resources, one of the essential pillar of socio-economical development. The growth of innovation capacity, valorization of teaching staff and students' creative capacity by the transfer of knowledge, products and technologies to the economical environment, represent one of the determinant factors of universities' socio-economic role. Through the specific character of the functions assumed in the society, universities are called to develop scientific research programs oriented to new directions and priorities in science, to manage research teams and schools of excellence. The society must accept the vital role of universities as important enterprise institutions, with an unmatched capacity and a flexible response to many modern problems, largely inter-disciplinary, which strongly attract the best talents (LERU, 2012).

Even if the scientific research and scientific works drawn up for the knowledge advance and teaching improvement are still important aspects of the university mission, the applied research and the activities developed to increase the national competitiveness and to solve the society problems gained an ever bigger importance (Geuna, 1999).

The term *research and development (C&D)* comprises three activities: *basic research, applied research and experimental development*.

Basic research represents an experimental or theoretical work carried out mainly to acquire new knowledge that stay at the basis of noticed phenomena or facts, without aiming to a practical application or utilization (Frascati Manual, OECD, 2002).

The **basic research** investigates the basic principles of phenomena. It has a strong potential to redefine our knowledge, to create new explanations, new possibilities and questions. It offers a

generic understanding, which is a "transferable basic aptitude" that can be applied to a much wider range of situations and phenomena than any other catalogue of specific knowledge. The basic research becomes more and more important as the time necessary to pass from the appearance of basic research innovation to its application in new technologies and processes decreases (LERU, 2012).

Besides the fact that the basic research in the universities creates the framework for their educational role, in the case of basic research the universities proved themselves extremely efficient in terms of costs. The explanation could consist in their non-hierarchical nature, the omnipresence of non-conformist young people, open-minded to original ideas, as well as in the extremely competitive nature of most of the funds directed to university research. Unlike them, the specialized research institutes have the funds relatively ensured and can focus on a mission without being distracted by teaching activity or other responsibilities (May, 1997).

Experimental research and development (C&D) includes the creative and systematic work carried out with the aim to increase the knowledge baggage, which includes knowledge about man, culture and society, as well as the utilization of this knowledge baggage to create new applications (Frascati Manual, OECD, 2002).

Applied research represents original investigations undertaken with the aim to acquire new knowledge. Yet, this type of research is directed mainly to a specific practical objective. **Experimental development** is a systematic work based on the existing knowledge accumulated from research or from practical experience, which refers to the production of new materials, products or devices, the development of new processes, systems or services, or the substantial improvement of those already produced or installed (Frascati Manual, OECD, 2002).

2. Materials and method

In the following, we shall present the results of a study where we have analyzed the factors that were involved in assessing the university scientific research, and the importance of these factors. In this study participated university teaching staff from the "Grigore T. Popa" University of Medicine and Pharmacy from Iassy. (UMF Iassy).

We have identified the priority research fields based on statistic data available at local and global health organizations. Knowing this, we propose to verify if:

Hypothesis 1: The academic personnel identify *National and international research programs* as the main external factor that influences the research strategy of the universities where they carry out their activity.

"Grigore T. Popa" UMF from Iassy promotes especially those fields in which the members of the academic community have accumulated expertise, and which can benefit of an already existing adequate research infrastructure:

Hypothesis 2: The researchers from UMF Iassy identify the *Competence level of the academic personnel* as the main factor of influence of the research priorities of the university in which they carry out their activity.

Hypothesis 3: The researchers from UMF Iassy identify *Competence availability at the level of the university academic personnel* as the internal factor that influences the research strategy of the university in which they carry out their activity.

3. Results and discussions

Each of the 74 researchers answered a set of questions concerning the factors, which influences the university scientific research.

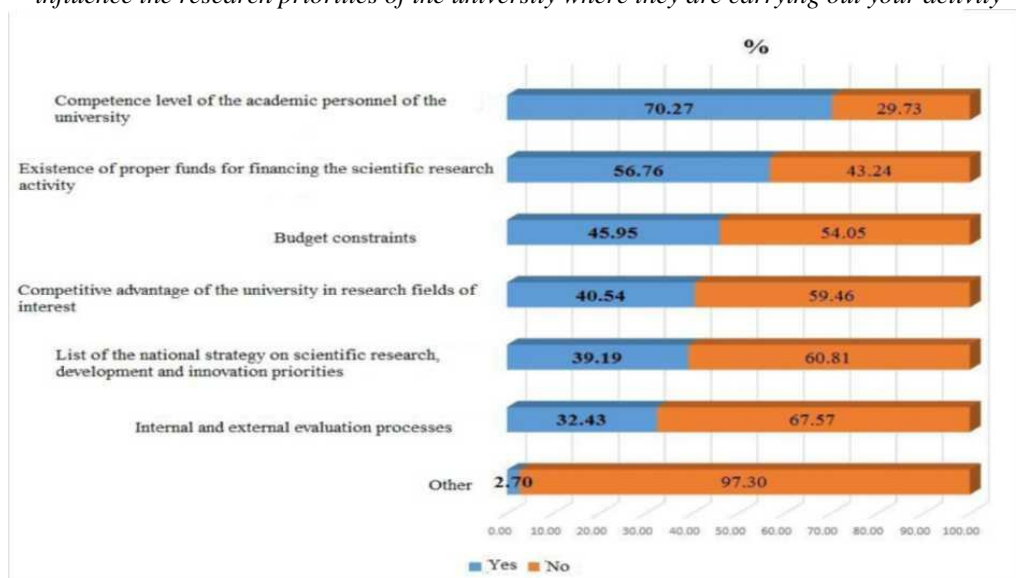
At the question: "**Which are, in your opinion, the most important factors which influence the research priorities of the university where you carry out your activity?**" from the questionnaire, the responding researchers chose, based on their personal opinion, one or more main factors of influence for the research priority of the university. The respondents have also the possibility to complete the proposed list with other variants of free answer.

In the opinion of most of the respondents, the factor, which influences the priorities of university research, is the *Competence level of the academic personnel* (70.3% of the total interviewed persons chose this variant of response). Besides the human dimension, the financial dimension plays a crucial role in the research activity; accordingly, the factors related to research funding and budget increase are essential. One can notice that the factors related to *Existence of the proper funds for financing the scientific research activity* and *Budget constraints* have important weights associated, namely 56.8% and 45.9% respectively. *The internal and external evaluation processes* in influencing the research priorities of the "Gr. T. Popa" UMF Iassy represents the factor less mentioned by the respondents (32.4%) (Figure no 1).

Besides the main factors included in the questionnaire, other factors have been identified based on researchers' responses. One of these factors concerns the human dimension and refers to the *segregation of researchers in substructures and the absence of interaction opportunities*. Still another factor suggested by a respondent concerns *topics with scientific and social impact during the period of contracts/projects development*.

Figure no 1 presents in a graphical form the weight of respondents in terms of the answers offered for each variant of response to the question from the questionnaire: ***"In your opinion, which of the following main factors influence the research priorities of the university where you are carrying out your activity?"***

Figure no. 1. Distribution of respondents according to their opinion on the most important factors, which influence the research priorities of the university where they are carrying out your activity



A series of external and internal factors influences the research strategy of the university. The interviewed persons had the opportunity to choose from a predefined list of external/internal factors, those which, in their opinion, are important for the university where they carry out their research activity. The most important external factors (for which we have recorded a major weight of respondents) are:

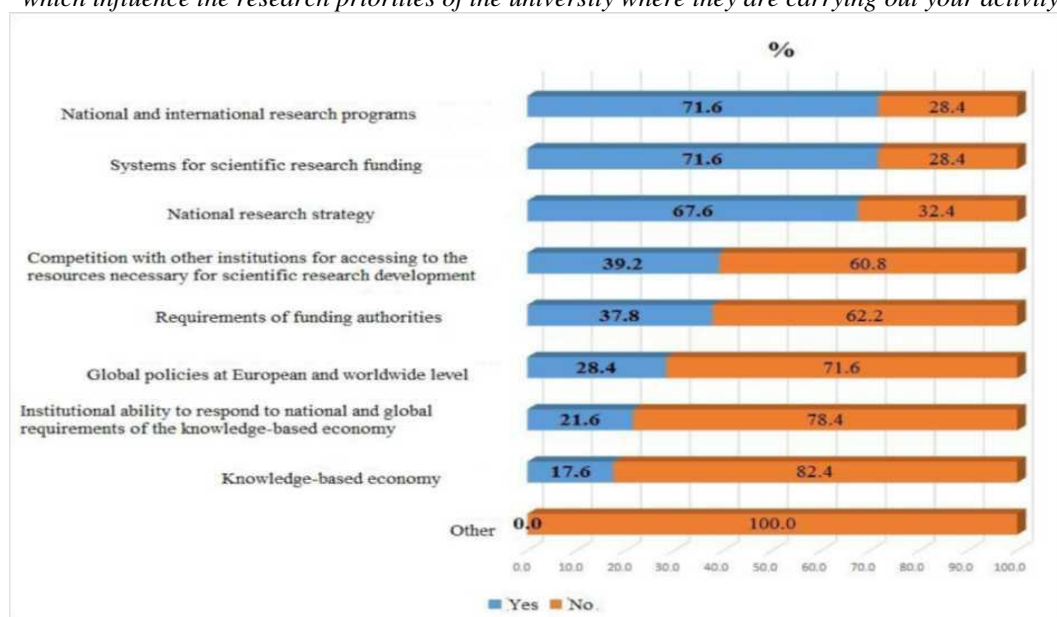
- *National and international research programs* (71.6% of respondents);
- *Systems of scientific research funding* (71.6% of respondents);
- *National strategy of research* (67.6% of respondents).

The knowledge-based economy and the *Institutional ability to respond to the national and global requirements of the knowledge-based economy* are the factors less mentioned by the respondents as having an essential influence on the research strategy of the university, recording weights of 17.6% and 21.6% respectively.

Figure no 2 presents the weights of respondents in terms of responses offered for each variant of response at the question: ***"Which are, in your opinion, the most important external factors which influence the research priorities of the university where you carry out your activity?"*** from the questionnaire.

What concerns the internal factors, which influence the research strategy of the university; one can notice the affiliation of the most important factors to two categories: factors related to financial resources (their own or accessed) and factors related to the quality of human capital. Thus, the internal factor mentioned most frequently as being crucial for the research strategy of the university is represented by *funding opportunities* (73% of respondents), while *financial resources of the university* are considered important in the opinion of 52.7% of respondents. From the prospective of the quality of human capital, the *competence availability at the level of university academic personnel*, this is important for about two third (62.2%) of respondents. We have also obtained a considerable weight of over 50% for the factors concerning the policy of recruiting valuable researchers, *recruiting/ preserving the researchers (students, doctoral students, and academic personnel) with important results of the performed research activity*.

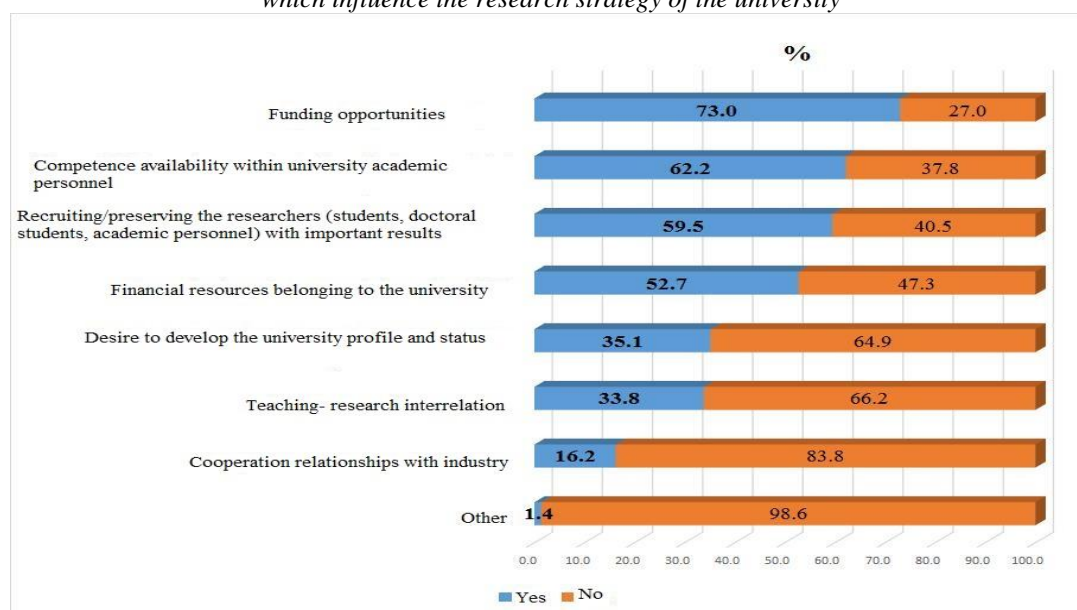
Figure no. 2. Distribution of respondents according to their opinion on the most important external factors, which influence the research priorities of the university where they are carrying out your activity



The graphic from Figure no 3 presents the weights of respondents in terms of responses offered for each response variant at the question: *"Which do you think to be the most important internal factors of influence for the research strategy of the university where you are carrying out your activity?"*

The relations of cooperation with industry, the teaching-research connection and the desire to develop university profile and status are the less mentioned internal factors that influence the research strategy of the university, recording weights that range between 16.2% and 35.1%.

Figure no. 3. Distribution of respondents according to their opinion on the most important internal factors, which influence the research strategy of the university



4. Conclusions

Based on their own opinion, the responding researchers have chosen one or more main factors which influences the research priorities of the university:

1. The factor of influence for the research priorities of the university, mentioned by most of the respondents, is *the Competence level of the academic personnel* (70.3% of the total interviewed persons chose this response variant). The obtained weight, net superior to the weight recorded by the other specified factors (of about 56%), identifies the "*Competence level of the academic personnel*" as the main factor which influences the research priorities of the university where the researchers from UMF Iassy are carrying out their research activity", thus validating the **hypothesis 2**.

2. According to the interviewed persons, the most important external factors for research strategy of the university where they are carrying out their activity (identified as factors for which we have recorded the highest weight of the respondents who mentioned them) are the *National and international research programs* (71.6% of respondents) and the *Systems for funding the scientific research*" (71.6% of respondents). The obtained result validates the **hypothesis 1**, according to which the *Academic personnel identifies the "National and international research programs" as the main external factor which influences the research activity of the university where they are carrying out their activity*.

3. The internal factor most frequently mentioned as being crucial for the research strategy of the university is represented by *funding opportunities* (73% of respondents), while from the prospective of the quality of human capital, *competence availability at the level of academic personnel of the university* is important for almost two thirds (62.2%) of respondents. Accordingly, the **hypothesis 3**, through which the researchers from UMF Iassy identify "*Competence availability at the level of academic personnel of the university*" as the main internal factor that influences the research strategy of the university where they carry out their activity, was not validated.

To improve scientific research activity in universities it is a necessary a constant concern to increase the level of competence of the academic staff. To increase the performance of university scientific research is necessary to provide increasingly higher certain amounts for financing this activity. This can be achieved by funding university scientific research from universities' own budgets and developing and implementing university scientific projects funded under national and international scientific research programs.

5. References

1. Atkinson R.C., Blanpied W.A., 2008, *Research Universities: Core of the US science and technology system*, *Technology in Society*:30-48, Elsevier.
2. Boulton G., Lucas C., 2008, *What are universities for?*, League of European Research Universities, p. 4.
3. *Frascati Manual - Proposed Standard Practice for Surveys on Research and Experimental Development*, 2002, OECD, Paris.
4. Geuna A., 1999, *The Economics of Knowledge Production*, Edward Elgar Publishing, Cheltenham.
5. League of European Research Universities, 2012, *Research universities and research assessment*.
6. *Performance-based Funding for Public Research in Tertiary Education Institutions: Workshop Proceedings*, 2010, OECD Publishing.
7. Zaiț D., Spalanzani A., 2006, *Research in Economy and Management. Epistemological and Methodological highlights*, Ed. Economică, București.