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MEASURING THE HEIS CONTRIBUTION TO SOCIETY

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Abstract

Over the last years, the interaction with the socio-economic environment was defined as the third mission of the higher education institutions (HEIs), along with the two other traditional missions, namely teaching and research. These three missions represent the foundation upon which HEIs are evaluated and they have a great impact on the strategy that schools are implementing in order to achieve their goals. International university rankings, which are global mechanisms of higher education performance measurement systems, have just recently started to develop indicators that measure the third mission activities. Thus, this paper provides a literature review of the indicators employed for the performance measurement of HEIs contribution to society.

The higher education institutions (HEIs) have always been recognized for their contribution to knowledge and innovation regarding the global development. Yet, even if they play a major role in the driving of competitive economies, it was not until recently that public attention was directed towards their connection to practice.

In the beginning, HEIs had the distinct role of forming specialists for different areas of activities. Therefore, they focused on teaching and training as their solely social functions (Abbott, 1988). However, over time, their role has evolved (Youtie and Shapira, 2008) and in the 19th century the scientific research activity emerged as a second mission of HEIs (Locke, 1985).

Recently a third mission came to light: the HEIs contribution to the development of the social and economic environment. Although new in name, this mission is not a revolutionary idea. As Laredo (2007) argues, the aim of academic institutions is to prepare students for their future employment, which represents a permanent contribution to the social environment.

HEIs and their environment

In our modern society, actors, institutions and their actions cannot be regarded and evaluated without analysing their connection to the social, economic and political environment. Thus, the 'third mission' or 'third stream' of HEIs (Laredo, 2007) was designed to include all activities that generate, use, apply and/or exploit knowledge outside the academic environment (Molas-Gallart et al, 2007).

As a result, the HEIs contribution to society represents a complex phenomenon that has at least three dimensions: free transfer of knowledge, innovation and entrepreneurship (Montesinos et al, 2008). In the second part of the 20th century, the third stream was pushed forward (Laredo, 2007). At that time, governments had realized that collaborations between companies and HEIs would allow the former to acquire the latest research results, as well as built a better infrastructure and have access to superior human resource.

Furthermore, HEIs also benefited from such collaborations. Looking to obtain additional revenues and other non-financial advantages, these organizations noticed that some of the third mission activities, namely business oriented research and counselling, helped them to attract money on the margin.

Defining the third mission activities

The current literature mentions the existence of a 'triple helix' or the 'entrepreneurial universities' (Etzkowitz and Leydesdorff, 1997 *cited in* Molas-Gallart et al., 2002), these expressions being used to explain the HEIs commitment to the social and economic development. The 'triple helix' is

defined as the interaction between industry, governments and academic institutions with the scope of creating 'entrepreneurial universities' able to patent and commercialize innovations. After all, HEIs have the social responsibility of "[meeting] the needs of regional and national economy, developing high-level skills for work, [playing] a more active role in job creation and the processes of welfare and prosperity of its context" (Arraut Camargo, 2010).

Performance indicators of the third mission

Due to the many ways in which HEIs and the economic environment can connect, it is not easy to establish the indicators that can be used for measuring the third mission activities. A lot of effort is needed in order to continuously expand the number of useful indicators and their quality. The literature draws attention to the fact that there is a deficit in understanding what the interaction with the socio-economic environment means, fact that makes the measurement extremely difficult to define (Bergebál Mirabent, J. & Sole Parellada, F., 2012).

Up until this point, several research papers have discussed the availability of indicators based on comparable data. Yet, there are important parts of third mission activities that cover informal and indirect knowledge transfer, activities for which indicators are more difficult to be established. This is why combined approaches are used to capture the dependency of third mission activities with the context and the dynamics of the business sectors that they serve (Slipersaeter, 2008).

The indicators employed for the innovation dimension refer to the services, products or processes that are transferred to the society (Montesinos, P. et al., 2008). Thus, indicators can take the form of number of invention disclosures (Ken, Y. et al., 2009), number of patents or other forms of intellectual property (Zhu, D. et al. 2010) that are generating incomes for HEIs and are closely related to the quality of HEI services (Cohn, E. et al. 1989).

The studies revised for the purpose of this paper include a larger number of indicators that cover a large range of interactions between HEIs and the social and economic environment in which these organizations activate (Sánchez-Barrioluengo, 2013; Zawdie, 2010; Laredo, 2007). One of the studies that extensively analyse this subject was realized in 2002 by a team of professors from the University of Sussex. Molas-Gallart et al. (2002) work aimed to establish a system of indicators for the third mission activities. As the authors stated, their research "provides an analytical framework and a comprehensive set of indicators that may assist in the tracking and management of university Third Stream activities" (Molas-Gallart et al, 2002).

Therefore by looking at UK, US and Canadian studies, as well as OECD's and European Commission's studies, the authors developed their own set of indicators. The authors grouped the third mission activities into groups and sub-groups of activities by distinguishing two main assets of HEIs: capabilities and activities. The activities include research, teaching and communication with the social and economic environment, while capabilities refer to the knowledge capabilities and the facilities that can be exploited and used for developing the HEIs activities. By distinguishing between these two types of assets, the authors discovered a wide range of third stream activities that can reflect the possible interactions between HEIs and their environment (Figure 1).

Each activity was linked with a set of indicators that are assumed to measure the output of third mission activities. In Table 1, we summarized the research results obtained by Molas-Gallart et al. (2002) by presenting the groups and subgroups of activities along with their indicators. The first category refers to the exploitation and use of knowledge capabilities. The activities included here are the actions taken by HEIs to commercialize their technological findings, their implication in developing new enterprises and the expansion of advisory contracts with different companies from the business field.

The second category points out the HEIs ability to exploit and use their facilities. The only activity included in this category refers to the commercialization of the facilities, which means that HEIs rent their location to organizations and companies that wish to hold a meeting in a formal educational environment.

The third category refers to HEIs research results. Yet, although there are a multitude of research activities established in HEIs, this category includes solely the research activities developed for the non-academic partners. The indicators employed for this category might refer to revenues collected from external sources, as well as the diversity of research subjects.

The fourth category revolves around the teaching activities. In order to be connected to practice, HEIs should make sure their staff members have experienced the business life, as well as to assure programs dedicated to working individuals and develop placement programs for current and future students. Thus, the indicators selected for this category relate to the number of staff members that are also employees of the business environment, number of industry scientists that are participating in disseminating knowledge in the academic environment, number of students placements and number of training classes performed for working individuals.

The fifth and last category refers to the HEIs ability to communicate with the social and economic

environment. The two activities included here concern on one hand the HEIs capacity to create a powerful social network and on the other hand the efforts they put into disseminating knowledge through non-academic publications and media appearances.

In addition to the above findings, Slipersaeter (2008) has prepared a comprehensive presentation on third mission indicators. The measurements selected were grouped in three categories that, according to him, prove the existence of an interaction between the HEIs and the socio-economic environment. These indicators revolve around the revenues obtained by HEIs from third mission activities, such as advisory contracts, patent ownership, development of training courses and so on (Table 2). Yet, the indicators presented by Slipersaeter are not comparable between HEIs, as these types of organizations do not make their financial statements available to the large public.

The two studies presented above incorporate the largest number of possible indicators that could be employed for the measurement of third mission activities. All the other papers reviewed for the purpose of our study mention indicators that are already included in table 1 or table 2.

Conclusions

The existent literature emphasizes HEIs need to show the usefulness of their research results (O'Shea et al., 2005). This fact has led many institutions, such as national and international bodies, to become more and more interested in third mission activities and to include this topic on their current agendas.

Yet, the current research has a long way to go. Although the discussions on third mission activities are not recent, this study shows that the indicators selected for third mission activities measurement are still limited in number. This fact represents a real problem as the demand for such indicators is increasing constantly. Even the most recent international university rankings (e.g. U-Multiranking) were built to focus on third mission indicators, as well as on the traditional teaching and research ones.

Thus, it is extremely important that research on third mission activities is further developed. Moreover, the indicator presented here should be refined so that they can better reflect the HEI contribution to society.

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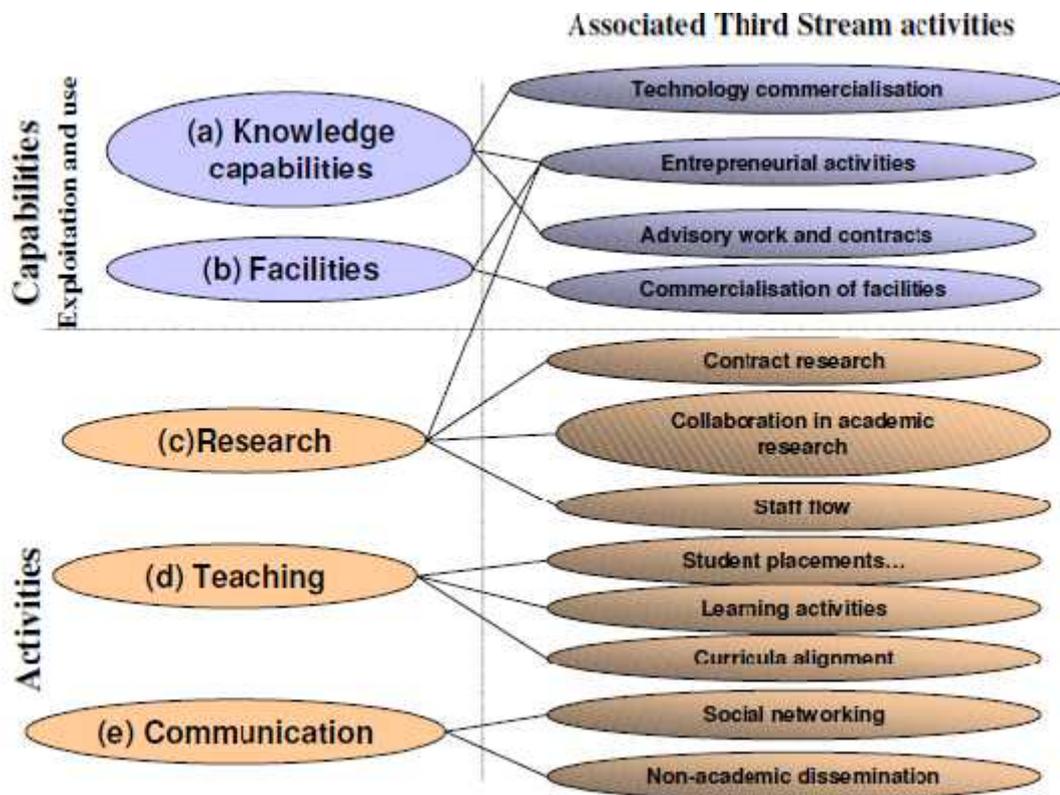


Figure 1. Third mission related activities
Source: Molas-Gallart, J. et al. (2002)

Table 1. *Third mission indicator*

Exploitation and use of knowledge capabilities			Exploitation and use of university facilities	Research activities
Technology commercialisation	Entrepreneurial activities	Advisory work and contracts	Commercialisation of facilities	Contract research with non-academic clients
Number of apply and patents	Number of spin-offs	Number of consultancy/advisory contracts	Revenues from facilities renting	Contract research revenues
Number of licensed patents	Number of commercial arms (firms set up by universities to carry out contract research)	Number of business meetings and conferences attended	Number of visits from companies	The diversity of research interest
Number of licensees	Number of start-ups			Number of external research funders
Royalty income	The survival rates, number of employees and amount of income the university receives from spin-offs, commercial arms and start-ups			
Number of technology types (patented and licensed)	The university support (business ideas competitions, university development funds and loan facilities) to such companies			
Cost and frequency of litigation over infringement of intellectual property rights				
Funds committed to IP management.				
	Teaching activities		Communication activities	
Flow of academic staff, scientists and technicians	Student placements and other links with potential employees	Learning activities	Social networking	Non-academic publications and media appearances
Number of research staff with temporary employment in industry.	Number of students placements	Number of trainings, teaching and other activities addressed to non-academics	Number of participations in business and trade conferences	Number of non-academic publications
Number of industrial scientists with temporary employment in academic institutions				Citations of non-academic publications
Permanent moves in both directions as a result of previous collaboration between academia and industry.				Participation in radio and TV programs

Source: Authors' projection after Russel Report indicators, Molas-Gallart et al. 2002

Table 2. *Set of Third Mission indicators*

Indicators of user-directed commercialisation	Both user-directed and science-directed commercialization	Science-directed commercialization
<ul style="list-style-type: none"> 1.Revenues from contract research for industry 2.Co-authorship academia – industry 3.Consultancy and expert advice to industry 4.Grey literature or confidential reports to industry 5.Graduates’ exchange with industry 	<ul style="list-style-type: none"> 1. Research results cited in patent applications 2. Publications in scientific fields of interest for business 3. Engagement in fields of science with a potential for commercialisation 4. Mobility of personnel between research institutions and industry 	<ul style="list-style-type: none"> 1. Patents applied for by the institution or its academic personnel 2. Patents granted to institutions or academic personnel 3. Revenues from licensing 4. The establishment of spin-offs owned by institutions or academic personnel 5. Existence of a support organisation for commercial activities 6. Existence of formalized rules for redistribution of revenues from commercialization of research results 7. Existence of courses in entrepreneurship

Source: Authors’ projection based on Slipersaeter’s presentation at INGENIO CSIC-UP