R&D&I PROJECT MANAGEMENT IN SPANISH UNIVERSITIES

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Abstract

The new role that universities possess in innovation, was promoted from an evolution both of the universities themselves and of the social frame in which they are inserted Thus, university research becomes one of the props of the development of society But, this new role, carries new difficulties and organizational challenges to an institution already complex (Bricall, 2000), (Sanyal & Bikas, 1995)]. In this process of adjustment universities have tested several models of management, to give fulfillment to the expectations of society.

The intention of this paper is to understand how the R&D&i projects managed in spanish universities. The analysis is carried out from a field study that shows that researchers, feel alone and lacking of the necessary resources to manage the R&D&i projects

Keywords: Management R+D+i, Project management

1. Introduction

1.1. History of the changes in university

Before the democratic transition, Spanish universities had very few opportunities to assimilate the Humboltiano model, based on the narrow link between teaching and research that had spread over Europe and The United States throughout the 19th century. According to (Sanz, 2003), the "transformations in the European and American universities scarcely reached the Spanish universities. Only after Franco's regime, they approached the necessary institutional reforms that helped to define, in the context of an extraordinary autonomy and capacity of self-government of university, the possibilities of normal development of the research and of reinforcement of the bows with the productive environment".

In the seventies other opinions arose about the problems that the R&D systems that had been created had and a worry developed about the difficulties in the utilization of the knowledge produced by universities. Thus, the transfer of technology and the connection with industry emerged as essential topics for the government, together with the later

incorporation of technological innovation. Simultaneously, from the theories and policies of regional development (Malecki, 1991), it pointed out that universities, and their scientific technical capacities were a potential mechanism, a lever for regional development.

Therefore, to both traditional missions of university, consolidated in the binomial teaching and research throughout the 20th century, a new mission was added in the last years: the transfer and exploitation of research results. In line with these observations new argumentations have been constructed about the radical changes that this new orientation produces in the nature of the way of knowledge production (Gibbons et al, 1994); it says that a new mode (Mode 2) characterized by the specificity, the trans- disciplinarity, has arisen. In addition the relations among university, government and company have changed with the emergence of a "triple helix " [(Etzkowitz & Leydersdorff,1997), a "new" type of institutional arrangement for the production and utilization of knowledge.

Thus, the evolution of university begins with efforts carried out by the state to promote research in general and, specifically, to improve the research level of Spanish university. In any case, the major weight of university in the Spanish research activity is also due to significant growth of the expense in high education that takes place in the eighties and first part of the nineties (OECD, 2002).Another factor that has influence on this evolution of Spanish university towards research has been the availability of public competitive funding of research activities, so that the normal development of R&D projects was allowed.It seems relevant, to indicate that the project policy understood as a general promotion policy of research activities by means of public summons, had its introduction in the eighties, and it meant a radical innovation in the Spanish science and technology system. Also thanks to this policy, and to the creation of the National Agency of Evaluation and Futurology (ANEF), one of the institutional structures in which the above mentioned policy was shaped, a healthy culture of competitive summons has been developed in Spain.

On the other hand, the normative reforms carried out in the university in 1983, with the approval of the Law of University Reform (LRU), aimed at a model's change in which research and service to society, by means of the transfer of technology, carrie to represent important values added to the traditional one of training by means of teaching (Jimenez &Moya, 2003).

The LRU raised a program of university opening to society and companies, besides a conceptual integration of research in its activities.

The article 11, which authorized the contracting of scientific works out of the university, created specific incentives to university teachers for the development of research under contract with companies and public administrations This article, now replaced with 83 of LOU (6/2001), established a special regimen for university government employees, in which these could increase their income by means of the establishment of " research contracts " or the rendering of services to Public Administrations or private entities. Therefore, individual incentives, supported by improvement of teachers' fee, were created for the development of R&D under contract.

Later on, this system was complemented by the approval of "researchers' sexenios" that were established remunerations for researchers dedicated to the Basic R&D, which have served to stimulate research commitment and scientific production (Jiménez Contreras et al., 2003), simultaneously they have turned into elements that demonstrate the researchers is

reputation, in spite of not being so lucrative in remunerative terms as the derived from the contracting with companies.

In the same way, LRU introduced, and LOU confirmed, the possibility that public universities could formalize agreements and contracts with the private sector to finance the accomplishment of research and development activities. This one was the first step that put the base for a culture of collaboration that is developing progressively, in the year 2002 a 19,63 % of the budget expenditure in research was financed by the private sector. Nevertheless, the research in Spanish university has been financed mainly by Public Administrations.

This progressive adaptation of university was made through different organizational schemes and even with new legal structures to manage these services. In this sense, Spanish university has created foundations in charge of continuous formation, has promoted independent legal institutions to favour the connection between university and company, has set up companies to manage some of its services, etc. To sum up, it has tested which is the best way of organization to give each type of service. Some recent analyses of the ways to carry out research and continuous formation in universities offer many examples of the enormous variety of organizational solutions that have been given in the performance of the different university services.

1.2. The services of research management in universities

The services of research management in universities are created from the Sciencie Law, in 1986, which entrusts functions of contracting (Article 17), creating or taking part in mercantile societies (article 19). For this reason, structures dedicated to research management, with different functions and with different organic and functional dependence are created.

In addition, the administrative services from universities have among their functions the support, advice, management and rendering of necessary services for the fulfillment of the university purposes. The article 39 of LOU, ratifies the exposed in the LRU, and establishes "research as a university function".

Therefore, the services of research management are in charge of facilitating the researcher with necessary specific support, with rapidity and efficiency, for the correct execution of research. According to the article 40 of LOU, the researcher has the right to have the information, advice and necessary administrative assistance to carry out research, since research is a right and duty of university professors.

2. Research Methodology

2.1. Selection of a sample

To select the public universities that took a part in the study they considered the income that they obtained from their research activities, including public and private financing derived from research projects. The criterion of selection was all those universities that possess a incomp bigger or equal to 10.000.000 Euros, qualifying 20 universities, representing 42 % of the total population of public universities.

2.2. Evaluation of Vice President for research

To know the opinion of Vice Presidents about research management, Vice Presidents / chiefs of research were consulted about the processes that they carried out to manage projects**.**

The sample target of study is formed by:

1-Vice Presidents or chiefs of research from 20 selected public universities.

Population universe	20 public universities
Perimeter of research	Spain
Modes of data collection	Personel mail intercept survey and personel in home survey.
Date of accomplishment	Begin: 15 de March 2007 End: 15 de September 2007
Sample size	20 Vice President research
Rate of response	55 % (11 Vice President Research)

Table 1: Specification sheet of the survey Vice President Research public universities

2.3. Questionnaire Vice President Research

The development of the questionnaire, was based fundamentally in checking the procedures of delivery of information, follow-up, control and evaluation of research projects, present on a R&D&i project cycle of life a, that Vice President Research carry out.

Initial Phase

In this phase, it is necessary to manage and promote the participation of university researchers in projects summons and the collaboration with other organizations in the field research.

The carried out activities are:

1. Dissemination of public summons, information about requirements, conditions and period.

2. Advice, taking into account the needs of every group of research.

3. Support on interested companies search.

4. Collaboration in contracts negotiation.

Execution Phase

This phase begins with the project authorization to researcher, or with the signing of the research contract (in case of contracts art. 83 L.O.U.).

In this phase,the different regulations that are going to mark in any way the economical administrative management of a research can't be forgotten.

Tasks of the research management service:

1. Information to the researcher of the conditions of the project authorization (initial date, admitted expense, possible modifications, date of ending, justification and reports). That is to sag, the requirements established by sponsor.

2.-. System of budgetary countable follow-up of expense and income derived from projects.

3. Exact Information to the researcher on the economic situation of research project.

4. Information on system of assistant personal and scholars selection.

5. Control of times of dedication and remuneration of PDI (researcher teaching staff), involved in the aforementioned project.

6. Juridical advice.

7.-Reports elaborated by the internal Control Unit / intervention in projects. Does transfer of funds exist among projects?

Closing Phase

Tasks of the research management service:

1. Justification to the different sponsors.

2. Justification in case of audits and controls.

3. Elaboration of Databases.

4. System of evaluation of project results and its effective application, as well as the internal procedure of intellectual property and exploitation results.

5. Claims presented by sponsors of the different projects and if it was the case the financial repercussion of them and the person or unit that takes the expense.

A consultation that had relation with the opinion that Research Vice President had of researchers fulfillment (periods, costs) was added.

1-Does periods and requirements fulfillment of the established documentation, exist on the side of the researcher?

2.4. Analysis of research groups

The research groups that took part in this study were selected. For that purpose, a size of sample of 20 % of the stratum was designed, which means 956 research groups. A designed sample was chosen since by a previous study the reticence that researchers had to answer this type of instruments was known. The minimal sample limit marked by statistic was of 355 show units, for a confidence of 95 % and a mistake of 5 %, but a major sample was gave guarantee of the validity of results.

In relation to the number of research groups that are inquired by university, the same percentage that represents every university inside the universe was applied to the size of the sample.

The selection of show units was carried out by means of simple random sampling. According to the table of random numbers.

The specification table of the survey of research groups from public universities is shown Table 2.

Population universe	Research groups 20 public university.
Perimeter of research	Spain
Modes of data collection	Personel mail intercept survey and personel in home survey.
Date of accomplishment	Begin: 1 de February de 2007 End: 15 de May de 2007
Sample size n	956 (Designed sample)
Rate of response	46% (university = 407,Centers and institutes = 36, Total corrected sample 443) 1,9 % sample be not valid
Mistake	3,7 %
Confidence level	95% , P = Q
Types of sampling	Sampling stratified with election of sample units by means of random simple system distributed in proportional form by university.

Table 2: Specification sheet of the public universities survey.

2.5. Questionnaire of research groups

It aims to know the opinion of the interviewed person about the processes of project management that Vice President Research carry out. These questions that then must be contrasted with the answers of Vice President Research organisms, were designed in the following way:

Aim: To evaluate the effectiveness of the research support services the university that.

Management service of research

Initial Phase

1. Dissemination of public calls, information on requirements, conditions and terms.

2. Advice, taking into account of every research group.

3. Support on search of interested companies.

4. Collaboration in contracts negotiation.

Execution Phase

5- Information to researcher on economic situation of Project research.

6- Information on system of assistant staff and scholarship holders selection.

7- Legal advising.

8- Support the use of computer science applications and electronic communication channels.

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Closing Phase

9- Internal rules to regulate intellectual property and explotation results.

10- Claims presented by sponsors of different projects.

Researcher Management

11- Do you fulfil the targets and term stablished in the contract?

12- Do you deliver partial and final informs on time?

13- Do you fulfil the laws and statutes that affect research?

3. Results

The results are compared, following the order Project Life Cycle Tabla 3. The analysis of the data picked up from vicepresidents in the starting phase indicates that:

o The dissemination process is evaluated as effective by all the universities, opinion that share researcher evaluating their average with 4,78.

o About the process of individual advising to research groups, the Vice Presidents indicate that it is only carried out when it is asked for or "sometimes" and researchers indicate in a 42.5% that the support is regular and 35.8% values it as bad.

	Average Vice President	Frequency of the Process	Average Researcher	Evaluation of the process
Dissemination	4,0	Always	4,78	Good
Needs	2,91	When it is asked for	3,47	Regular -Bad
Contracts negotiation	3,09	Sometimes	3,23	Regular
Search of companies	2,45	When it is asked for	2,91	Bad
Personal Information	3,55	Always	3,71	Regular -Good
European Projects	3,27	Always	3,13	Regular -Bad
Computer sciencie application	2,55	When it is asked for	3,16	Regular -Bad
Legal Advising	3,64	Always	3,20	Regular -Bad
Tracking Information	2,64	Always	**	
Economic Tracking	2,82	Always	4,17	Good
Results projects	1,64	Never	**	
Registry nonconformities	1,82	Never	2,58	I do not know

Table 3: Average of the processes of projects management in public Universities.

** Processes nonconsulted to research groups

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o Related to the support in the search of companies, Vice Presidents Research indicate that it is only carried out when it is asked for; however the activity was valued as bad by a 41% of researchers. It was analyzed, in addition, if there was difference of opinion with respect to the search of companies process by a researchers it existed, following the amount of budget that the group managed, Table 4.The results indicated that those groups that managed a major budget estimated on 300,000 Euros, had equal or worse opinion that those than handled a lower budget.

		Search of companies to research groups					Total
		It does not exist	I do not know	Bad	Regular	Good	
Annual Budget R&D&i	0-6000 euros	5	10	12	4	3	34
	6001-300.000 euros	38	55	138	64	20	315
	300.001-600.000 euros	4	6	12	9	3	34
	600.001-1.500.000 euros	2	5	2	4	0	13
	1.500.001-30.000.000 euros	0	1	3	1	1	6
	Sobre 30.000.000	1	1	0	2	1	5
Total		50	78	167	84	28	407

Table of contingency 4: Annual budget R+D+i. Search companies groups public universities.

o Referring to the collaboration in the contract negotiation a 41.7% of the Vice Presidents indicate that the activity carried out is, nevertheless researchers have a great dispersion of opinions, 27.5% consider it regular, 19.2% of them consider it good and 19.4% consider it bad. The Table of contingency 5 was carried out, to know if the contract processes that were well evaluated by researchers corresponded to contracts with companies.

The analysis of data indicated that only 14% of the research groups that worked with companies evaluated the management well since the other 5.2% corresponded to the opinion of the research groups that managed public projects. Demonstrating this way that the process of contract support with companies is evaluated of regular to bad by researchers.

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		Negotiation of the contract for the group					Total
		It does not exist	I do not know	Bad	Regular	Good	
Budget finance by companies	0%	23	80	29	33	21	186
	Between 1% and 20%	4	15	30	39	32	120
	Between 21% and el 50%	5	3	13	25	12	58
	More of 50%	5	2	5	11	11	34
	I do not know	1	0	2	4	2	9
Total		38	100	79	112	78	407

Table of contingency 5: Budget financed by companies * Negotiation contract group. Public universities.

In the phase of execution of the project they carried out six consultations whose answers are given next:

o   With respect to the support to the researcher for the selection of staff and scholarship holders, Vice President Research in a 66.7% of the sample, indicated that it was an activity that carried out was. Researchers, however almost 65.1% as evaluate it a service of regular to good.

o   As far as the legal advising on intellectual property and results of explotation is concerned, a 66.7% of Vice President Research indicate that it is an activity that is always carried out opposed to a 44.2% of research groups that consider the activity of regular to good showing a clear disagreement with the process.

o   In relation to the support in the management of European projects a 50% of the sample of Vice President Research indicate that they carry out realise the activity. The rest of universities execute it only, when it is asked for, nevertheless, a 53.6% of researchers think that the service is only of regular to bad evaluating in only a 12.8% as good.

o   As far as the support to researcher in the use of electronic communication channels to postulate to projects is concerned a great dispersion of answers exists among universities, Table 6, where it is shown that a part of universities only carry out this process when it is asked for.

The opinion of research groups is that support is evaluated as regular or bad by a 58.7% of the sample.

		Frequency	Percentage	Truthful Percentage	Accumulated Percentage
Truthful	Never	2	18,2	18,2	18,2
	When it is asked for	4	36,3	36,3	54,5
	Sometimes	2	18,2	18,2	72,7
	Always	3	27,3	27,3	100,0
Total		11	100,0		

Table 6: Computer science applications. Public universities.

o   In relation to consultations regarding the sending to researcher in a permanent way of the economic situation of the project, a 91% of Vice President Research indicate that an economic tracking of projects exists and 81.8% (only) reveal that information about tracking project is carried out, being only economic tracking. As far as research groups is concerned 47.2% of research groups consider good the economic tracking and 33.2% as regular.

In the closing phase the two processes consulted to Vice President Research are not carried out, being the system of evaluation of the project results the least used, as it is shown on Table 7 of frequencies. In relation, to the processes of nonconformities registry research groups do not receive information on the complaints made by sponsors, therefore, a 50.6% do not know if this information exists against a 7.9% who consider it as good.

		No	Sometimes	Yes
Results projects	Frequency	7	1	3
	Percentage	63,6	9,1	27,3
Registry nonconformities	Frequency	6	1	4
	Percentage	54,5	9,1	36,4

Table of Frequencies 7: Vice President Research public universities.

The analysis of these results in the context of the changes that Spanish universities live make evident that weaknesses and problems exist in the model of management of the centralized research that universities have adopted.

The evaluation of Vice President Research management lets us know that the organism owns a better opinion of the services that it gives than the one researchers do. But also the belief exists that they must improve support services, lack of personnel specialization, rotation and deficiency of resources are factors that Vice President Research indicate as variables that affect the projects management that they carry out.

4. Conclusions

The valuation of service management of Vice President Research from public universities that researchers carry out "is bad", they feel alone and devoid of the necessary resources to manage projects. Vice President Research however do not value their management bad and are conscious of a series of problems which must be considered nowadays as:

- o   Deficiency of human resources described in relation to the activity to develop.

- o   Lack of budgets or lack of economic resources to manage research.

- o   Exponential increase in the number of public calls in projects in the last years.

- o   The demands for the control and audit of aid.

- o   Little clear norms of sponsoring organisms as far as eligible expense and term (in some autonomic funds) is concerned.

- o   The general norms of Public Administration, sometimes too rigid, that makes difficult the research management.

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