
UNIVERSITY -INDUSTRY INTERACTION: a critical analysis of a federal University based at São Paulo.

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ABSTRACT

This research aimed to understand how the Technological Innovation Center (NIT) of a federal University based at São Paulo transfers technology to the productive sector. For this purpose, a qualitative research based on the application of a semi-structured interview guide with researchers of the institution was performed. The university-industry interaction is a key strategy for promoting social and economic development of nations. With the technology transfer from universities to companies, they can acquire the knowledge necessary to constitute its competitive edge and stay on the market. In turn, this technology can be converted into goods and services to society. In addition, a portion of the profit gained through this partnership may be invested in university infrastructure. If all stakeholders collaborate, all are benefited. The results found by this research show that there is a lack of qualified personnel for university's NIT, precarious infrastructure, absence of a Technology Transfer Office (TTO), absence of institutional policies definition with regard of formal channels of technology transfer, weak dissemination of research and developments by the university to the business community and inefficient bureaucracy.

Keywords: *university-industry interaction, technological innovation, technology transfer*

INTRODUCTION

When we think of innovative companies, it is inevitable that come to our minds companies like Apple, Google and Facebook (Leuzinger and FERNANDES, 2012). And in Brazil? How to leverage the production of technological innovation in our country? This article addresses the issue of cooperation between universities and the productive sector as a way to promote technological innovation in national companies, making them more competitive in the market.

Discussions about cooperation University-Enterprise (EU) have been stimulated since 1970, due to the short life cycle of innovation. The beginnings of these studies took place in Germany in the nineteenth century, reaching the UK in the early twentieth century. However, the practices concerning such relationships acquire a more defined personality in the United States from the early 1980s (SCHMOCH, 1999; SBRAGIA, 2006; GARNICA; FERREIRA-JÚNIOR; FONSECA, 2005; IPIRANGA; FREITAS e PAIVA, 2010).

In Latin America, the reality was different. By basing its development on importation of technology, the University, through the creation of extension pró-reitorias, devoted himself to more tasks of cultural and welfare-oriented and the leading role of human resource training for the absorption of foreign technology. Brazil was no different until the 1960s, with the end of import substitution policy in the 1980s and the creation by the government of Science and Technology Policy (C & T) that Brazilians began to spend more attention to technological development (IPIRANGA; FREITAS e PAIVA, 2010).

The innovation process, perhaps more than any other economic activity, depends on knowledge (FELDMAN, 1994), whose new role in the economies and the production process has led to a repositioning of the role of universities, which are not only responsible for transmission of information, but also started to generate crucial

knowledge to the evolution of some economic sectors (RAPINI, 2007). Thus the argument of the Triple Helix, where government, university and business come together in support of national technological development, has been widely used to convince the university to cooperate with the private sector (DAGNINO, 2003).

In this context, the findings of this research reveal the main problems encountered for effective University-Enterprise interaction at Brazil, mainly inside a federal institution based in São Paulo. As well as proposing viable solutions to be minimized the difficulties identified in order to strengthen cooperation between the productive sector and scientific and technological institutions (ICTs).

RESEARCH PROBLEM AND OBJECTIVE

In the developed economies innovation appears as an engine for economic and social development, this diagnosis stems from descriptive scientific evidence of the field of study of the economics of Innovation, but in actuality of societies on the periphery of capitalism assumes normative role (SILVA, 2012). In this context new role attributed to universities, distinguished from the traditional center of training and research, to responsible for empowering technology companies in an increasingly competitive market (CLOSS; FERREIRA; SAMPAIO e PERIN, 2012). In order to implement this new role the University now has, at least institutionally, agents of cooperation or Technological Innovation Centers (NITs) in order to intensify the interaction university-industry (EU). However the society to institutionalize this new role for universities, not dismissed the previous ones, among them the diffusion of knowledge especially through scientific publications (BENEDETTI; TORKOMIAN, 2011).

Historically, private Brazilian companies are risk averse represented by the activity of Research and Development (R & D) (IPEA, 2013). Which is aggravated by the need of the researchers of universities to publish their research results, thus reducing the monopoly power provided by patent protection for their investments (CLOSS; FERREIRA; SAMPAIO e PERIN, 2012; DAGNINO, 2003; SILVA, 2012).

Another current challenge to the consolidation of the University's interaction with the productive sector is the lack of entrepreneurial culture in Brazil, although the country has high degree of entrepreneurship few people claim to know personally someone who started a new business in the last two years, when comparing countries with the same level of development (GEM, 2013). This fact can be explained due to three groups of companies in the country (private, State, and national offices of foreign multinationals) carry out activities complementary and non-competitive character between them (SILVA *apud* FURTADO, 1972). So, there is no great motivation for companies operating in Brazil to invest in research to advance technologically.

This challenge leads to another, which is the shortage of qualified staff in universities and Brazilian companies to work and mediate the interests of the partnership. Despite the creation of public policies by the government in order to promote technological innovation and increase the competitiveness of Brazilian companies, the infrastructure on the organization and management of resources (informational, technological, financial, physical) required to implement cooperation U-I in the country is still precarious..

Although discourse regarding U-I interaction (university, company and government), especially in the government side, deem its importance to bring the socio-economic development for the country, in practice, it is perceived that these actors have low level of interests and commitment for that effectively happens cooperation in Brazil. Such contradictions justify studies like this aimed at exploring the intensity, ways and means to university-industry interaction with the research questions: How is the cooperation of the NIT of a federal institution based in São Paulo with business? And that contracts and arrangements are articulated to achieve this interaction?

This research has the overall goal of understanding how the Technological Innovation Center of a Sao Paulo-based federal institution transfers technology to the productive sector.

LITERATURE REVIEW

The stimulus for technological projects with the business sector is based on the argument that these interactions promote access to knowledge and technological skills of the partners, in addition to minimize the financial risks inherent in research and development activities, at the same time that allows new resources to research activities (FUJINO, STAL, PLONSKI, 1999; GIBBONS, 1992; PAVITT, 1993). It was assumed that if these interactions were emulated in Brazil, the same economic development achieved in developed countries would be raised here (SILVA, 2008).

The intensification of interactions between universities and industry, from the 1980s, on the one hand has been reflected in the creation of several institutional mechanisms for technology transmission and knowledge, on the other signals a process with bilateral flows of knowledge and techniques (MEYER-KRAMER; SCHMOCH, 1998).

The contributions of universities to the process of innovation in firms can be summarized as: more general knowledge source needed for basic research activities (Nelson, 1990); source of expertise related to the technological area of the firm (KLEVORICKET al., 1995); training and training of personnel capable of dealing with problems associated with innovative process in firms (ROSENBERG; NELSON, 1994); new tools and scientific techniques (ROSENBERG, 1992); creating nascent firms (spin-offs) by academic staff (STANKIEWICS, 1994; ETZKOWITZ, 1999).

In Brazil, under the legal framework established with the publication of Technological Innovation Law (10.973 / 04) (BRAZIL, 2004) and Decree No. 5,563 / 05, which regulates the Law, Institutions of Science and Technology (ICTs) ought to adapt their administrative structures to create a Technology Innovation Center (NIT), in order to manage institutional innovation policy, with minimum obligations standards set by the Government. Since law introduction, the studied federal institution has established their body responsible for implementation of this policy is the Technology Innovation Center (NIT).

To optimize the technology transfer from the University to companies, the NITs can count on specialized groups in market analysis, valuation of intangible assets and so forth, this arrangement is known as Technology Transfer Office (TTO). These have as their central mission to increase the chances that the discoveries from universities and research institutes into products and services which can benefit society. (DIAS & PORTO, 2011 *apud* CAPART & SANDELIN, 2004,p. 267).

The table 1, below, presents the potential alternatives a NIT endowed with the necessary resources could accomplish:

Table 1- Formal channels for transfer of technological knowledge

Transfer channel	Description
Temporary employment of an academic	A firm temporary employs an academic
Research consortium	A firm participates in a research consortium of more than one public research institute/university and more than one other (chemical) firm
Minority equity in an academic spin-off/out	A firm buys an equity in an academic spin-off/out, but does not have management control
Consultancy and advice	A firm consults an academic on his/her existing knowledge for a definite issue
Research joint venture	A firm establishes a research joint venture with a university/public research institute and a separate research entity is created
Contract R&D	A firm pays for a requested, definite piece of work at a university/public research institute
Research funding	A firm funds exploratory research at a university/public research institute
Buying a license/patent	A firms buys a license or patent from a university/public research institute

Source: Gils, M. van, Vissers, G., & Wit, J. de (2009). Selecting the right channel for knowledge transfer between industry and science: consider the R&D-activity (p. 500). *European Journal of Innovation Management*, 12(4), 492-511. doi: 10.1108/14601060910996936

The formal channels of transfer of technology listed in the table above are the means by which the University or Research Institute may establish interaction with the productive sector. The means are the formal mechanisms that such institutions have as alternatives to consolidate and transfer the technology produced in its scope to the companies with which they are interacting.

In turn, the forms are the ways that universities use to attract companies to establish partnerships. Research, higher education and training personnel capable of dealing with problems associated with the innovative process in firms (ROSENBERG; NELSON, Ob cit.); creation of new instruments and scientific techniques (ROSENBERG, Ob

cit.); creation of firms springs (spin-offs) for academic personnel (STANKIEWICS, Ob, cit.; ETZKOWITZ, Ob, cit.) are examples of the ways that Technological Innovation Centers (NIT) can be used to achieve that end.

In developing countries, the first distinction when it comes to University-Industry interaction lies in the low level of P&D activities carried out by private firms. Consequently, are exceptions, the firms that have as a routine competition and growth strategy based on internal generation of knowledge. Most of the activities of P&D is held by the public sector, via State-owned enterprises, research institutions and federal universities (SUTZ, 2000; DAGINO, 2003). This scenario is confirmed by the current national industrial configuration that is more focused on the innovation in process, rather than in new products introduction as evidenced by the PINTEC SURVEY (IBGE, 2002 and 2010).

The table below presents the rates of national innovation in extractive industry and information according to the data of the PINTEC SURVEY 2011:

Table 2: Rate of innovation in the extractive and transformative industries (1998-2011)

Reference Period	Innovation Rate	Product Innovation Rate	New Process in the country Innovation rate	Process Innovation Rate	New Process in the country Innovation rate
1998-2000	31,52	17,58	4,13	25,22	2,78
2001-2003	33,27	20,35	2,73	26,89	1,21
2003-2005	33,36	19,53	3,25	26,91	1,66
2006-2008	38,11	22,85	4,10	32,10	2,32
2009-2011	35,56	17,26	3,66	31,67	2,12

Source: IBGE (PINTEC SURVEY)

As can be seen in the table, considering only the industrial sector, after a continued growth in the rate of innovation in four surveys (of 31.52 percent to 38.11%) there was a decrease to 35.56% in the period 2009-2011 (IPEA, 2013, p. 3).

Despite the creation of sector funds and the subsequent launch of numerous grant programs to support the development of joint research between universities and companies, including the pharmaceutical industry and financial support provided by Financiadora de Estudos e Projetos – Finep, National Research Council – CNPq and the Ministry of health in order to promote the strengthening of basic research have stimulated the emergence of partnerships (PROTEC, 2008), the survey conducted by the Brazilian Institute of geography and statistics-IBGE showed low rate of national innovation, reflecting a few investments in P&D activities by the private sector. According to the PINTEC SURVEY 2008, the main source of acquisition and development of new industrial technologies came via acquisition of machinery and equipment, in a context in which most companies presents only activities occasional of P&D (57.13% of total). In the edition of 2011 PINTEC, realize that this same pattern of innovation based on the access to technological knowledge through the acquisition of machinery and equipment remained, appearing as the activity considered of importance high or medium for 73.5% of innovative enterprises belonging to the scope of the research.

According to the data of the PINTEC SURVEY 2008 and 2011, the size of the company has close relationship with the completion and profile innovation in industrial and service companies, although, at first, this fact hangs with more intensity. The characteristics of U-I interaction include: the predominance of interactions with large and medium-sized enterprises; the initiative to search for researchers by companies, in most cases, via informal relationships; few licensing deals (less than 0.7%) or of know-how transfer (8.5%); and the relevance of incubated companies and innovation environment (CLOSS; FERREIRA; Sampaio and PERIN, 2012; IBGE, 2010 and 2013).

Thus, from the analysis of the data of the PINTEC SURVEY 2008 and 2011, corroborate the arguments of Furtado (SILVA apud 1972) about the character completing and uncompetitive Brazilian companies to each other, and likewise the argument of De Negri (2012) that in Brazil, the main obstacles to innovation in the productive sector consists in the interaction of concentrated industry structure on sectors less dynamic technologically and low production scale of enterprises, mainly in sectors more knowledge-intensive and high internationalization of national productive structure, which shifts the nucleus of knowledge generation out of the country.

The focus of the innovation process is the introduction of new products, processes or services, with the goal of leveraging the social and economic development process. Its results are important elements for increased competitiveness, allowing the dynamization of local economies and better insertion in the markets. For this purpose one must have access to knowledge, active essential at the current stage of knowledge economy.

An innovation is the implementation of a new or significantly improved product (good or service), or process, a new marketing method, or a new organizational method in business practices, workplace organization or external relations (OECD, 2005, p. 55).

Recently a new practice arrangement was proposed by the federal Government to stimulate the realization of technological projects with the business sector, this is the Inova Empresa Plan, created in 3/14/2013. The plan consists in allocation of investments in innovation in the productive sector in order to raise the productivity and competitiveness of the Brazilian economy. To achieve this concern, the goals are the expansion of the level of investment, provide greater support for projects of technological risk, strengthening of relations between enterprises and public sector research institution and definition of strategic areas (MCT, 2013).

There is also, the Inova Talentos Program a partnership of National Scientific Committee – CNPq with the Euvaldo Lodi Institute IEL –, which is also a way to encourage the production of innovation in the country.

The INOVA Talentos is a program that aims to expand the number of qualified professionals in innovation activities in the private sector in Brazil. Stimulate the Brazilian industry to remain competitive, diversified and innovative is the way for the sustained development of the country. The INOVA Talentos Program was designed based on these concepts, with the concern of encouraging the creation of innovative projects in companies and private institutes of research and development (P&D). The idea is simple: select, train and enter the professional market to carry out innovation activities (IEL, 2013).

Despite these arrangements do not directly encourage Brazilian companies to interact with universities they are important measures to promote increased production of technological innovation in processes, products and services in the productive sector. In search of effecting such innovations, organizations may consider, alternatively, contact the universities that typically have adequate infrastructure and skilled professionals to develop new technologies.

METHOD

In the framework of qualitative approach, various methods are used to approximate the social reality, in this sense the methodology should be appropriate to the objective proposed, so this research is exploratory in their purpose, and qualitative on the approach.

The transformation of raw data collected in research results involved the use of certain procedures to systematize, categorize and make possible an analysis by the researcher. For this analysis was employed the technique of qualitative discourse analysis based on categories that were built from the national and international theoretical references on the University-Industry interaction, presented in this article..

Over the years, this technique has been developed and improved and, currently, its application is aided by software that facilitate the work of the researcher. However, the interpretation of the data is up to him. To put it into practice were followed the steps of pre-analysis, data collection, exploration of material, data processing and interpretation.

The first step included the pre-analysis which involved the review of national and international literature, in databases available via *Portal de periódicos CAPES* and at the base of *Scielo* journals, plus books and archival material of the research team. In addition, the data collection by means of semi-structured interviews with researchers who have already taken part in the process of university cooperation with the productive sector.

The second step was to analyze the situation of data collection and preparation of material to be analysed, beginning the exploration of the material which was performed by means of transcription and validation of the interviews seeking to complement or match information or understanding.

In the third step the data were characterized formally by transcription and validation of interviews, then the data were organized, based on the a priori constructed categories, namely from the theoretical referential being they: actors, intensity, ways and means. At this time was defined as the response encoding unit of each interviewee, and as contextual unit each interview transcribed.

The fourth step occurred after obtaining an initial set of categories, the researchers turned to the enrichment of the corpus through a divergent process, including the following strategies: deepening, connection and expansion. Based on what has already obtained, the researcher shall review material in order to broaden your knowledge, discover new angles and deepen his vision. The researcher can also explore the links between the various items, trying to establish relationships and associations and passing then combine them, separate them or rearrange them. Finally, the investigator will seek to expand the field of information identifying the emerging elements that need to be more fleshed out; one sees that the process of documentary analysis has a concatenated development (LUDKE and ANDRÉ, 1986).

RESULTS & DISCUSSION

The findings of this research were discovered through interviews with six researchers or professors of the institution from different campuses located in the metropolitan region of São Paulo, in the Institutional technological innovation center, as well as in their official response dated 4/29/2014 to the process of requesting access to identifiable documents the University technology transfer to the productive sector.

With regard to the first category of analysis, the actors involved in the University-Enterprise interaction within the institution, as well as in theory, are the University, the Government and private sector. However, for each respondent, the focus of cooperation differs. For example, for two respondents, the focus is on companies, generally, of the industrial sector.

As for the other two, the focus is the role of the Government providing resources for funding research agencies, such as FAPESP and CNPq, in order to encourage the production of technological innovation in the country.

According to one of the observed, the roles of the three actors involved have equal importance to the success of U-I cooperation within this institution. And, according to one of the researchers, the University is the main responsible for the consolidation of interaction. Given the fact that the university itself has to unfold the ties it has made in order to block a connection with the business world.

It is perceived that there is still the paradigm that interact with the corporate world is not a noble activity to which the University can devote. Publish articles in high impact journals is considered more important. Thus, if could diminish the patent monopoly power of the organizations that have invested in such research. This is in contradiction of this theoretical work cited, which justifies studies like this that seek to better understand this phenomenon.

For the second category of analysis of this study, the intensity of U-I cooperation in institution, verifies that it is weak. One of the main reasons is the poor infrastructure provided by the University. For example, the absence of a structured Technology Transfer Office (TTO), the low performance of the University's supporting Foundation (FAP) in the intermediation of interests and contracts involved in partnerships with companies and the scarcity of qualified personnel..

In addition, this paper confirms the lack of entrepreneurial and innovative culture in Brazil and that the failures in the administrative apparatus of the University and of the Government constitute big challenges to achieve the adequate intensity in the interaction U-I, as well the intended objectives.

Regarding the third category of this research, the forms of interaction U-I within the University, it was found that the institution studied does not established formal channels and well-defined policies for technology transfer. According to one of the respondents, the explanation for this is that the partnership with companies rarely occurred. The contacts used to be made solely between the researcher and the company. Therefore, the University didn't get involved with activities of this nature. However, all the researchers interviewed suggest that the institution could stimulate the development of more research and train personnel capable of dealing with problems associated with the innovative process in firms (op. cit.).

One of the teachers also suggested that the creation by the NIT in conjunction with FAP of an organized system to attracting external resources would also be a way to promote cooperation U-I at the University.

None of the respondents mentioned the creation of new instruments and scientific techniques, creation of new firms (spin-offs) for academic staff as possible ways to establish the interaction, as proposed in national and international theories on the topic.

The findings pertaining to the latter category of analysis, the means by which this institution establishes the interaction in its scope, show that the University does not have a well-defined means. One of the respondents cited

the P&D Agreement and the purchase of a license, patent and others as the most widely used means to establish University-Industry interaction. However, didn't know whether these means are actually used. Another respondent states that the P&D contract is the only means by which the institution establishes partnerships.

According to another researcher in the speech would be P&D contracts, license, purchase a patent and minority capital of a spin-off company. However, no means was established in practice. Another respondent commented on the purchase of licenses or patents, stating that the University did not offers assistance to the researcher or the company and therefore it is up to the teacher to seek a way to write the patent.

According to one of the respondents, there would be no kind of set for the establishment for partnership with companies. While another researcher says that in one of the campuses, located within a habitat of innovation, the means most used are the Covenants and patent licensing. Not knowing about the other campuses of the University.

Researcher temporary employment, research consortia, academic consultancy or advice, joint venture research and purchase a license or patent are described in the literature as other means that were not cited by any of the researchers of the institution.

Those answers of respondents refer us to the fact that every researcher has a different opinion about what ways and means are possible of how to establish partnerships with the productive sector. This allows us to consider that none of them know specifically what ways and means are available at the University to interact with companies. Since every researcher does what believes is feasible to carry out the tech transfer produced along with organizations. It might be noted that this situation is a result of the poor infrastructure of the NIT. This precarious infrastructure could led to inappropriate communication and undermine that all employees of the University which are involved in cooperation with U-I (researchers, officials of the NIT, among others) have a better understanding about what they can or not to commit when take part on partnership within the institution.

In the visit held at NIT, it was observed their structure is institutionalized at the University, but is not recognized by all staff (employees, faculty and students) as a major organ for the institution. Additionally it appears that the core staff consists of only two public servers and a member with a scholarship funded by FAP, the latter being responsible for legal procedures before the institution. According to one of those responsible, the Technology Innovation Center would not have availability of persons to assist in the identification of processes of interaction U-I. The lack of staff causes overwork to employees, a fact that denotes its low level of institutionality.

Other factors that reduce the performance of the Technology Innovation Center in their functions are the absence of employees who have experience in both worlds: the business and academic. So they can mediate the interests of both parties in the best possible way. However, this leads to another limiting factor which is institution's own organizational culture, professionals who did not build academic career are less valued at the University. Thereby, hinders the hiring of qualified personnel that has experience in the corporate world because usually these professionals have another type of career development.

Another problem that the Technology Innovation Center (NIT) at the studied institution has been facing is the lack of strategic planning before contacting companies. The NIT could seek to establish partnerships with companies that can contribute to projects that are already with advanced development stage. But, to take such a measure, it is necessary that University find a match with the needs of the potential partners (organizations) and verify that they would be really interested in investing their resources (financial, human and technological) in such projects.

This context refers to another obstacle to the Center that relates to the uninviting aesthetic of its electronic site. Throughout the research, the site was not properly updated (contains information that does not match with the reality of the NIT), causing a prejudice to its disseminating of events and partnerships established between the Center and the productive sector. There is also the absence of a well-defined marketing strategy to attract companies to establish cooperation U-I in the framework of the institution.

Most respondents were dissatisfied with the compensation they receive to develop activities related to the development of new products, services or processes when cooperation with companies.

Based on the statements provided by researchers of the institution and other findings regarding the ways and means by which the university establishes partnerships, we could hypothesize that the distribution of profits (regulated by the Innovation Law) obtained university-industry interactions are not adequately used.

The set of these barriers reduces the performance of the institution to perform all the functions that a technological innovation center must play in order to increase the chances that the discoveries made within the University into benefits for society, at least in the form of products and services (op. cit.).

Nevertheless, it is worth remembering that not only the NIT, but also other centers of technological innovation in Brazil, in General, exhibit deficiencies in their infrastructure. The NIT of Unicamp, named Inova, which is considered a successful case of technological agency from a Brazilian University, invests heavily in marketing and also presents such failures.

According to Silva (2008), there would be the possibility of the interest of the academic community, especially at the Campinas State University – UNICAMP, to create a consulting market in the city. The good marketing of this University builds and consolidates the myth that Campinas is a city of high technology..

The myth attracts the interest of other organizations to come to Campinas and seek consulting activities of the academic community. In turn, that ennobles and promotes the good reputation of the scientists of UNICAMP and makes them active in municipal politics. An example of the impact of the marketing of this institution is the fact that two of the respondents cited the Inova as a reference model that could be followed by the researched institution.

Therefore, based on the interviews, on visit to the NIT and the comparisons with the theoretical framework, it was possible to see the precariousness of the University infrastructure, the shortage of qualified personnel and the absence of formal mechanisms which allow the promotion of University-Industry interaction within this institution. In addition, there is no effective collaboration, interest and commitment of all the actors involved and interaction, which makes it difficult to achieve the objectives proposed in this relationship.

The solutions proposed in this paper to mitigate these difficulties that the center has found are discussed in the next section.

CONCLUDING REMARKS

It was noted the absence of formal channels of technology transfer that were referred to in the literature, such as: researcher temporary employment, research consortia, academic consultancy or advice, joint venture research and purchase of a license or patent which could foster the University-Industry interaction within the researched institution. It was also verified the absence of education and training personnel capable of dealing with problems associated with the innovative process in firms. The shortcomings in the bureaucratic organization of the institution, the lack of a well-defined marketing strategy and the unpleasant aesthetics of electronic site constitute a major challenge to the achievement of the interaction.

The proposed solutions to mitigate these difficulties are: discuss how is the distribution of profits (established by the law of innovation) obtained through cooperation U-I that might be suitable per researchers and collaborators of the NIT, as an award for success to maintain; and attract and retain skilled labour. In addition, it is suggested that an auditing process to check if the distribution is being done according to the law. Therefore, this process must be handled by qualified persons in the NIT with experience and knowledge of the functioning and dynamics of the business and academic world so you can perform the intermediation of interests of both parties. For that, is needed a structural change and culture at the University, in which not only the academic career is valued. Thus, it is likely that there is a more appropriate measurement of the impacts of the interaction and the production of a technological innovation really tradable within the University.

The institution analyzed could by optimizing its administrative apparatus improve communication between actors potentially involved, better define the formal channels for technology transfer, favouring training of skilled personnel, which would support the development of innovative products or processes in companies. The implementation of these actions would improve the efficacy favouring the effective cooperation between the University and the private sector in institution.

The formalization of the Technology Transfer Office (TTO) so the NIT can perform activities such as feasibility of registration and protection of intellectual property – IP developed by the community of institution, fostering the industrialization and commercialization of technologies generated by the University, management of the institution's intellectual property assets, promotion of programs, researches developed and opportunities for collaboration between University and Industry creating a friendly business environment involving PI, the provision and intermediation of technology services, consulting and specialized training in the area of intellectual property, and negotiate partnerships, agreements and technology transfer agreements.

The Government could provide resources (human, financial, technological, informational, among others), in addition to support a regulatory framework which favours the necessary autonomy for Federal universities permitting them to play the expected role in the economic and social development.

Strengthening basic research continues as cell *mater* University, subsidizing the future joint development between universities and businesses. Therefore, it is necessary for the institution and productive sector involved in the interaction the use of sector funds of Science and Technology to finance research projects.

The diffusion of the possibilities of partnership at all levels of Government through programs to promote innovation for Brazilian companies, like Inova Empresa Plan. Through this plan, joint plans are carried out, consisting of public calls for the selection of the projects that will be supported by grants or others mechanisms available by BNDES, Finep and public organizations (BNDES, 2011). The Inova Talentos program is another important part of set of important stimulus for innovation production in the country.

The NIT could also outline an appropriate marketing strategy seeking to broaden their knowledge about the needs of companies with which it is intended to make the technological transfer and interact with Inova programs managers, favoring the possible spaces for the institution's interaction with the productive sector. In addition, the Center could create an organized system for external funding by reducing its dependency on the federal Government and a strategic plan before seeking companies offering technologies.

This research aimed to the challenge of access to identifiable processes of technological transfer of the Center for Technology Transfer to the productive sector, the challenge was raised after NIT claimed for information confidentiality, and subsequently not to favour the access to documents due to the shortage of employees in his team; the identification of a contract or process was only made at the end of the research. Being this process concerning the cooperation established between researchers of the institution and Companhia Vale do Rio Doce.

As this case embraces a relationship between a Brazilian multinational company and the unique Campus of the institution belonging to an innovation habitat arrangement, it is interesting to explore how this interaction occurs and their operating mechanisms. From the results found in this research and because of the growing importance of the University-Industry interaction as viable strategy of socio-economic development of Nations, in particular those in the periphery of the capitalism, it is important that studies like this continue, aiming to deepen the knowledge of how the University establishes partnerships with the private sector.

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