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OBSTACLES TO TRIPLE HELIX MODEL: A STUDY WITH PROFESSORS IN MINAS GERAIS STATE

OBSTÁCULOS AO MODELO TRIPLA-HÉLICE: UM ESTUDO COM PROFESSORES NO ESTADO DE MINAS GERAIS

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Abstract

The present work seeks to analyze the perception of professors about the possibilities and difficulties of integration between University, Market and Government in the local context of Montes Claros-MG, Brazil. This study was carried out using mixed methods. Methodological procedures were carried out based on qualitative data collection through semi-structured interviews and quantitative data collection performed by survey questionnaires. Data was triangulated for a better analysis of the findings. Four practical issues emerged as important factors that influence the integration capacity among the agents: fragility and lack of institutional support to ensure legal stability; motivations of Professors; the need of external agents interest for the activities carried out at the university and, finally, the importance of an administrative technostructure capable of providing support.

Keywords: Triple-Helix. University. Research. Extension.

Resumo

O presente trabalho busca analisar a percepção de professores sobre as possibilidades e dificuldades de integração entre Universidade, Mercado e Governo no contexto local de Montes Claros-MG, Brasil. Este estudo foi realizado usando métodos mistos. Os procedimentos metodológicos foram realizados com base na coleta qualitativa de dados, por meio de entrevistas semiestruturadas e coleta

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quantitativa de dados, realizada por questionários da pesquisa. Os dados foram triangulados para uma melhor análise dos achados. Quatro questões práticas emergiram como fatores importantes que influenciam a capacidade de integração entre os agentes: fragilidade e falta de apoio institucional para garantir a estabilidade legal; motivações dos professores; a necessidade de agentes externos interessarem-se pelas atividades desenvolvidas na universidade e, finalmente, a importância de uma estrutura tecnológica administrativa capaz de fornecer apoio.

Palavras-chave: Tripla-Hélice. Universidade. Pesquisa. Extensão.

Introduction

This paper aims at analyzing Professors' perception about the possibilities and difficulties of integration between University, Market and Government - an association that represents the essence of the Triple Helix Model - in the local context of Montes Claros-MG, Brazil. Our interest, throughout the article, is to demonstrate the potentialities of integration existing in that municipality and what are the possible factors that hinder the implementation of the model proposed by Etzkowitz and Leydesdorff (2000) in the regional development of the municipality, located in the mesoregion of Northern Minas Gerais State.

We defined as the research problem: *what is the perception of university professors from Montes Claros-MG, Brazil, about the dynamics of university-government-market integration in that municipality?* With this study, we take a critical look at the elements that comprise the Triple-Helix model, in view of the contradictions and conflicts that the authors pointed out when using this model by Brazilian Universities, leading to compulsory mutations of these interactions, debated in an incipient way in the context (LUENGO; OBESO, 2013; SCHREIBER, BESSI, *et al.*, 2013).

The study was conducted in the city of Montes Claros-MG, located in the north of Minas Gerais State, Brazil. According to França, Pereira, Soares and Medeiros (2009) the north of Minas Gerais State is comprised of 89 municipalities, and 20% of the population is concentrated in Montes Claros. It is a municipality with capacity to articulate with several neighboring municipalities (it represents the second largest road junction in the country), high concentration of institutions offering higher education (30 institutions in 2015), as well as the increase of industrial plants in the region. The choice of this city as a place of study was, in addition to questions regarding data accessibility by researchers, due to the fact that it is a university pole, which is consistent with the guiding objective of the study, namely obtaining Professors' view regarding the integration of the University with other sectors of society.

This study was developed by using mixed methods: literature review, qualitative data collection through semi-structured interviews, and quantitative data collection through survey questionnaires. Data was triangulated for a better analysis of the findings and, then, an analytical narrative was established, summarizing the main aspects found. Our argument in this article is that there are contextual limitations to the proper implementation of the model in the studied reality, especially with regard to the support structure and the dynamics of motivations and interests of local agents.

This article is divided into 5 sections. The first, comprised of this introduction, summarizes the theme. The second section is the theoretical review, which will analyze the role of teaching in the interconnection between agents, as well as the presentation of developmental models that led to the construction of the Triple-Helix model by Etzkowitz and Leydesdorff (2000). In the third section, the methodological procedures are presented, followed by the fourth and fifth section comprised of the results and analysis and conclusion, respectively. Finally, the references that guided the present research.

Teaching and the triple helix: proximity between the concepts

University is comprised of parts that are precisely devoted to teaching, research and extension and which have their internal and environmental particularities. On the one hand, the academic environment must seek to adapt to the demands of the community in which it operates and

the international research environment in which knowledge is generated (ARCHANJO, 2016; GOMES, COELHO; GONÇALO, 2014; SUDBRACK; NOGARO, 2017). On the other hand, University currently has several clients. Such a multifaceted set of characteristics is reflected not only in the university but also in teaching. Thus, teaching ends up 'attracting' different attributions to that of teaching, since teaching is not the only activity and often may not be considered solely fundamental (FELDEN, 2017; SLEUTJES, 1999).

In this sense, it is clear that there are many uncertainties to which the academic areas are subjected since, by serving several masters or several clients, it creates 'a cloud of uncertainty' about the true object of the University, which is lost in the middle of so many possibilities. In this context, the tasks of existential reflection and cognitive training in the full and socio-structural sense of the student become problematized and sometimes distant from the expected result, since the priority is sometimes the fulfillment of current market demands.

It is important to remember that some authors such as Bernheim and Chauí (2008), Luengo and Obeso (2013), Rieu (2014), Rosa (2014) and Sudbrack and Nogaro (2017) have difficulties specifying what should be the primary outcome expected from universities, as they cite the preparation of the individual for the labor market as the only variable of community demand, even though recognizing that there are other forces that aim to bring to the academic environment the responsibility for the demands of market innovation or economic demands of companies.

It is known that capital is inserted as one of the basic needs of any institution, and in the context of universities, this same need is visible. Thus, meeting market demands, as well as forming partnerships with companies, is a way to satisfy this dependence on the capital that university has (BARCELOS; MOCELIN, 2016; BERNHEIM; CHAUI, 2008; SLEUTJES, 1999; SUDBRACK; NOGARO, 2017). According to Barcelos and Mocelin (2016), this suppression of necessity can occur by offering consultancy, technological and innovative development by professors and students. The possibility of offering services has made the academic environment even more complex, turning to the market to ensure the sustainability of its purposes.

Among these dilemmas, there is the figure of the professor, who mediates the academic needs and current business demands - which strongly impact the University's operations. Professors are the main symbol of the University, as they also represent it with the student and the market (BARCELOS; MOCELIN, 2016). We can say that the professor is the contradictory figure in the whole scenario, because, while referring to a role of conducting a participatory teaching aimed at eradicating poverty, solving social problems and promoting self-realization of society (BERNHEIM; CHAUI, 2008), also refers to a regulator of the University's adequacy to a capitalist market that may differ from these aforementioned teaching missions (BARCELOS; MOCELIN, 2016).

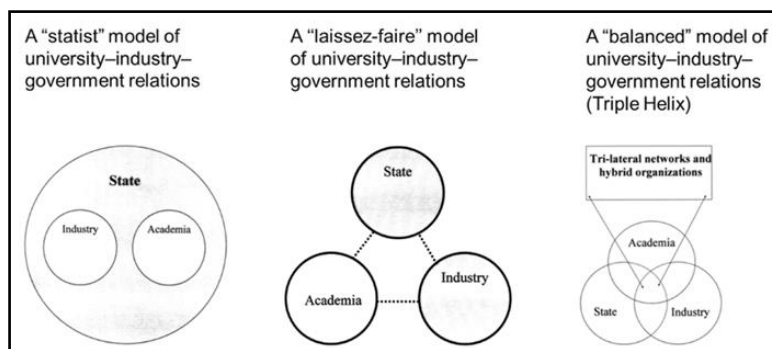
Barcelos and Mocelin (2016) claim that, as an intermediary agent between University and Market, the professor has fundamental characteristics between Academy and Market, in which consultative, research and management attributes emerge. In addition, these characteristics are mixed with those personal and intrinsic to each professor, which may corroborate or corrupt the interaction between University, Market and Government. Thus, following the work and demand of teaching is not a neglecting attitude of the University, but an emerging need that configures its ability to generate new knowledge (SUDBRACK; NOGARO, 2017), provided that the community demands and their sociocultural singularities are respected.

Luengo and Obeso (2013) state that companies seek to acquire knowledge from all possible contexts in which they are inserted, since they need to reach the elucidation of their customer's most intimate desires and interests (GOMES; COELHO; GONÇALO, 2014; SCHREIBER, BESSI, *et al.*, 2013). According to Sletjtes (1999), professors hold the knowledge in their hands, and so they are advantages for the University, which, in turn, also becomes, in a broader sense, an organization that is able to connect the company to the knowledge (RIEU, 2014).

In order to initiate a 'new age' of interactions between knowledge agents, Etzkowitz and Leydesdorff (2000) coined the term 'Triple Helix' that would illustrate a new phase of knowledge sharing. In this model, University, in a central role, would act for innovation in conjunction with Government and Market, forming a model of continuous distribution of knowledge as a tool. Such a model was proposed after Etzkowitz and Leydesdorff observed the Massachusetts Institute of Technology (MIT) and the level of interaction it had with its surroundings. Thus, they concluded about the relevant interaction between University and its partners for the growth and technological development of a segment. The first attempt at models to demonstrate the interactions related to economic development was made in 1960, with the representation of the 'Sabato Triangle' and the

'Petrlho Tetrahedron', respectively (CUNHA; NEVES, 2008). From that period, the three main models of economic-developmental representation emerged (Figure 01).

Figure 1: Representations of the development stages of the Triple Helix model



Source: Ranga & Etzkowitz (2013)

Figure 1 shows the three interaction models between University and Market, which also have knowledge as their central role. In the first, the 'Static Model', Cunha and Neves (2008) indicate the different intensity of participation among the agents. State has a high participation contribution in relation to other agents. Government participates by assigning norms and regulations in order to direct the actions of universities and companies. This is a primary stage of implementation of the Triple-Helix model, where the capacity of the submissive agents to act is compromised.

In the second model, the 'Laissez-Faire', there is an equal freedom of action of all agents, making clear the attenuation of government participation and the separation between agents (CUNHA; NEVES, 2008). This establishes strong boundaries between agents, in which each one is responsible for their subsistence and economic rationality (*laissez-faire*). This individualistic model does not exactly follow the initial, static purpose, which treats everyone within a dependent system, not individual initiative.

In the third model, the Triple Helix, the Academy, State and Market are holders of a level of intersections and interactions added to the personality of each agent. This model can contemplate the different states of knowledge capitalization. In this sense, despite the freedom, individuality and equality between agents, there are also areas/actions of cooperation and mutualism among them - although there is the possibility of one agent assuming the role of the other (CUNHA; NEVES, 2008; ETZKOWITZ; ZHOU, 2017; GOMES; COELHO; GONÇALO, 2014), which generates hybrids of all kinds. There is no development project that supports them, but only the contingency of the needs of each of the agents.

Still regarding the third model, we see incongruities as to whether or not to defend the government's participation in interactions, since for Gomes, Coelho and Gonçalo (2016), government would stiffen market-university relations, making them increasingly bureaucratic. On the other hand, Etzkovitz and Zhou (2017) understand that this entity would contribute in providing incentives for innovation among the other agents.

In the model, University has the primary role of hosting knowledge, seeking solutions that meet community demands, as well as structuring a workforce for the market. Therefore, it is in the University, for the most part, that the technological inventions that will integrate the market arise. The role of the market would then consist in the presentation and formulation of the demand that society has, which does not prevent exclusionary delimitations of such demands. Finally, government would mainly play the role of building projects that facilitate University-Market interaction (ETZKOWITZ; LEYDESDORFF, 2000; LUENGO; OBESO, 2013).

According to Natário, Couto, and Almeida (2012), Triple-Helix aims to trigger, encourage and stimulate the process of business and territorial innovation, a model based on the socially relevant role of universities for economic development. It can be seen then that this view places the university as a player of the market and not as an autonomous entity of human formation based on ontological organic singularities, thus favoring biased behaviors to only one specific (economic) development (SUDBRACK; NOGARO, 2017).

For Natário, Couto, and Almeida (2012), the territory's competitiveness depends not only on the benefit of its traditional resources, but also on its innovative dynamics. Territories with positive

attitudes towards innovation are more competitive in a world of global dynamics. According to Etzkowitz and Zhou (2017), innovation usually depends on informal strategic alliance formations, which enable companies and other organizations to share and complement each other's knowledge. Cooperation is even more important as innovation becomes more and more complex.

Thus, the hybridization between University and Market has encouraged professors to do research aimed at benefiting companies in exchange for large funding or negotiations (RIEU, 2014). A survey by Gulbrandsen and Smeby (2005) indicates that corporate funding increases the amount of research applied, also increasing the variety of themes and technologies analyzed at the university, as well as increasing the autonomy of the researcher, thus, providing greater free traffic between market and university. On the other hand, many researches are directed to the movement of capital, and their results are confidential only to the company that injected resources for it, thus, damaging the universality of science (GOMES; COELHO; GONÇALO, 2014).

Methods

The present study aimed at analyzing the perception of university professors from Montes Claros- MG, Brazil, about the dynamics of university-government-market integration in the referred municipality. Thus, there was an investigation about professors' perception about the relationship of educational institutions with these external agents and their relevance in the scenario of teaching, research and extension. The specific objectives were to verify the education and the teaching trajectory of the interviewees; to analyze professors' involvement with the educational institution; to investigate professors' performance regarding the development of research, teaching and extension and to measure the openness and collaboration for partnerships, verifying professors' perception towards them. The study was conducted with professors from the Federal University of Minas Gerais (UFMG) and the State University of Montes Claros (Unimontes). We chose to have as participants of this research professors who have had connection with research activities and/or extension.

We sought to make use of mixed methods due to the need for greater richness of information sources that corroborate the analyzes proposed in this article. As data collection techniques, the semi-structured interview in the qualitative phase and the survey questionnaire in the quantitative phase were used. The research universe was comprised of all professors of the Institute of Agrarian Sciences of the Federal University of Minas Gerais (ICA/UFMG) and the State University of Montes Claros (Unimontes). The research population of interest was comprised of professors who had had connection with research and/or extension activities in the last 2 years.

The data triangulation technique was used. According to Denzin and Lincoln, "the use of multiple methods, or triangulation, reflects an attempt to ensure a thorough understanding of the phenomenon in question" (2006, p. 19). Thus, the use of Comparative Study in conjunction with the Individual Interview promoted freedom to validate narratives with quantitative opinion variables, verifying typical or atypical regularities of answers with greater credibility.

In the qualitative phase, interviews were conducted with 17 active research/extension project coordinators, as they were relevant agents with great participation in the teaching, research and extension pillars, and, therefore, would offer more detailed answers. The semi-structured interviews took, on average, one (01) hour to be applied. Out of the 17 participants, 12 have a doctoral degree, 1 has started the doctoral program (underway) and 4 have a postdoctoral degree.

The interviews were transcribed and, for the construction of the qualitative analysis, the software Atlas TI version 7.5.12 was used to analyze the content of the interviews. Codes that represented each subject or perception were addressed, and the analysis of each topic was done separately.

In the quantitative phase, the sampling used was intentional, which, according to Appolinário (2012), involves the choice of elements due to their particular characteristics or relevance to the object studied. The questionnaire was sent by e-mail to 167 professors. The response rate was 33.33%. An 11-point Likert scale was used to measure professors' agreement on contact between university and external entities (Block 1) and on stimulus to partnership (Block 2).

The data obtained in the research was coded and tabulated to receive statistical treatment in the software SPSS (Statistical Package for the Social Sciences). After tabulation, an exploratory analysis of the data was performed. At this stage, no questionnaires that did not meet the search criteria were identified. Thus, 100% of the questionnaires were considered acceptable. To evaluate the reliability of the data, Cronbach's alpha was used, which is one of the best-known reliability

indexes for internal consistency for questionnaires, verifying if each factor really expresses a single idea through the set of variables indicated (HAIR JR. et al., 1998).

The alpha is analyzed by observing a variation from 0 to 1; the closer this value is to 1, the greater the reliability of the factor. George and Mallery (2003) provide the following rule: > 0.90 - Excellent; > 0.80 - Good; > 0.70 - Acceptable; > 0.60 - Questionable; > 0.50 - Bad and <0.50 - Unacceptable. Importantly, high reliability does not guarantee good results, but there are no good results without reliability. Table 1 presents the results for Block 1 (contact between university and external entities), while Table 2 presents the results for Block 2 (partnership stimuli).

Table 1: Cronbach's alpha (Block 1: contact between university and external entities)

Questions in Block 1	Cronbach's alpha if the item was excluded
Habit of interacting with local businesses	0.912
Habit of interacting with local organizations – Third Sector	0.916
Habit of interacting with local government	0.918
Demand for Local Business Partnerships	0.914
Demand for Partnerships with Local Organizations - Third Sector	0.925
Demand for Local Government Partnerships	0.919
Habit of seeking partnerships with local businesses	0.918
Habit of Seeking Partnerships with local organizations - Third Sector	0.922
Habit of seeking partnerships with local government	0.921
Cronbach's alpha = 0.927	

Source: Research data, 2020.

Regarding questions from Block 1 (contact between university and external entities), Cronbach's alpha value is rated as excellent. This high reliability was achieved after the withdrawal of 6 questions. Items that did not contribute to increased reliability assessed professors' views on some aspects of partnership. As the term 'opinion' carries a certain amount of subjectivity, it was decided to remove these items for further analysis. Regarding questions from Block 2 (stimulus to partnership), Cronbach's alpha value is rated as good.

Table 2: Cronbach's alpha (Block 2: stimulus to partnership)

Questions in Block 2	Cronbach's alpha if the item was excluded
Satisfaction when partnering	0.751
University incentive to partner with local business	0.762
University incentive to partner with local organizations - Third Sector	0.761
University incentive to partner with local government	0.761
Local Companies are interested in establishing partnerships with Universities	0.758
Third Sector local organizations are interested in partnering with Universities	0.759
Local government is interested in establishing partnerships with Universities	0.741
Professor's interest in participating in research projects that have partnerships	0.740
Professor's interest in participating in extension projects that have partnerships	0.750
Professor's interest in participating in management activities that come from partnerships	0.752
Do you feel you could have more initiative for partnerships?	0.774
Do you feel that local business, Third Sector and government could take more initiative in partnering?	0.751
Do you know public policies that foster partnerships?	0.758
Do you feel yourself like an essential agent for local economic and marketing development?	0.753
Cronbach's alpha = 0.769	

Source: Research data, 2020.

The results were systematized in narrative format, as will be presented in the next section. The analysis was subdivided, according to the indicated blocks, into two subthemes: contact between university and external entities and stimulating partnerships, respectively. The following is the consolidated analysis in two topics: 1) Professor's involvement with University; 2) Relationship Professor-Partnerships.

Results and discussion

First, through frequency distribution, stratified analysis of the respondents was performed, followed by descriptive statistics to calculate the central tendency, dispersion and position measures. Table 3 summarizes the characteristics of the sample.

Table 3: Sample Data

	Classification	Frequency
Gender	Male	51.0%
	Female	49.0%
Age	Between 35 and 45 years	37.3%
	Between 25 and 35 years	35.3%
	Between 45 and 65 years	27.5%
Education	Doctoral degree	74.5%
	Master degree	23.5%
	Specialization	2.0%
Exclusive Dedication to the University	Yes	84.3%
	No	15.7%
Seniority	Until 5 years	62.7%
	Between 5 and 10 years	17.6%
	Between 20 and 30 years	7.8%
	Between 10 and 15 years	5.9%
	Between 15 and 20 years	5.9%

Source: Research data, 2020.

The predominant profile of research participants was between 25 and 45 years old, doctors, the vast majority being under exclusive dedication and working in higher education, in general, for 5 years or less. A profile of relatively young professionals working in local public universities. We now proceed to the results obtained in relation to the points analyzed in the two blocks of the research.

Contact between university and external agents

The scores obtained in terms of integration and contact between university and the other helixes of the model ranged from medium to low, so that, according to respondents, there is still no consolidated dynamic of supply and demand of partnerships in the region (Table 4). What is extracted from the data is that the level of integration between the helixes is generally low. This low level indicates a weakness in the process of creating innovation and research, partnerships and joint initiatives between the helixes of the model proposed by Etzkowitz and Leydesdorff (2000).

Table 4: Descriptive scores of questions from Block 1

Questions	Agreement Evaluation					
	N	Min	Max	Mean	Med	S.D.
Habit of interacting with local businesses	51	1	10	5.43	6.00	3.34
Habit of interacting with local organizations – Third Sector	51	1	10	4.92	5.00	2.91
Habit of interacting with local government	51	1	10	4.51	4.00	2.91
Demand for Local Business Partnerships	51	1	10	4.45	5.00	2.82
Demand for Partnerships with Local Organizations - Third Sector	51	1	10	4.73	4.00	3.04
Demand for Local Government Partnerships	51	1	10	4.14	4.00	2.81
Habit of seeking partnerships with local businesses	51	1	10	5.47	5.00	3.15
Habit of Seeking Partnerships with local organizations - Third Sector	51	1	10	4.59	4.00	2.89
Habit of seeking partnerships with local government	51	1	10	4.82	4.00	2.78

Source: Research data, 2020.

Regarding the University's relationship with local government, it is noticeable that professors have little habit of interacting with local public authorities (Mean = 4.51) and, similarly, the level of local government demand for partnerships and joint actions is low (Mean = 4.14). As a result of this interaction, there was no established habit, from the professors' perspective, of seeking partnerships for research, teaching or extension with local government (Mean = 4.82). In this sense, we understand that the level of integration between these two helixes is weak and, therefore, needs improvement.

In the case of relations between University and local businesses, it was identified that professors have some habit of interacting with entrepreneurs (Mean = 5.43), but the level of demand of these companies for partnership activities that can generate innovation and gains is low (Mean = 4.45). Professors indicated that they have a habit of looking for local companies for possible partnerships (Mean = 5.47), but the discrepancy between the two previous results may indicate that there is some resistance or disinterest on the part of the local business group for partnerships that can generate innovation in business.

The findings also indicate that professors have little habit of interacting with local organizations in the Third Sector (Mean = 4.92), as well as their demand for partnerships with the University (Mean = 4.73). The reflex result is that the habit of seeking partnerships with local Third Sector organizations is also low (Mean = 4.59).

Among the incipient possibilities of partnerships, the most outstanding is the relationship of the University with business groups. However, a scenario is noticeable where such relationships are still fragile and unable to lead to the development of the local context as expected by the Triple-Helix model. In this sense, it was investigated, among the qualitative data from the interview phase, what are the possible aspects that can help to explain the status of the phenomenon as presented in Table 4.

The first of the causes cited by respondents concerns the issue of suitability or interest in developing partnerships. Some interviewed professors reported that much of their interest in developing a teaching career relates to teaching or research, but commonly they are not integrated into all the activities that comprise the teaching-research-extension tripod. For this reason, it is common to find professors who are only interested in teaching or research activities.

01: At university, I am aware of this issue of the inseparability of teaching, research and extension. So, I need to do all three things, we don't always have affinity for all three. But then we have to work in this direction, of course the main objective remains teaching, but at the university, research and extension are also demanded ... (Interviewee 4)

02: I created a dream in my head that market was what I wanted, until the moment I did an internship, and saw that the company wasn't just a bed of roses, that all in an industry get a lot of pressure... When I left the internship, I saw that it was not only good things, maybe innocence of my

own graduation, and then linked to that, and *some of my relatives were at the University at the time, and then they started to tell me about research, graduate school, then I sought and started participating in a Scientific Initiation Program, I was contemplated, then developed a project and then I identified the issue of my affinity, my taste for research* (Interviewed 3)

03: It was like this ... An opportunity came up, the question of having ease in communicating. *I will not lie, I have always liked teaching since I was little, I already wanted to be a teacher ... at the time, there were also circumstances... as soon as I finished the master's degree, REUNI Program came up. Then they opened new vacancies, and then, other types of work did not interest me much...* Then I ended up like this, I wanted and had vocation, let's say, and all the opportunities that came to me were in the field of teaching as soon as I finished my master's degree (Interviewed 10)

The answers above illustrate conditions of professors' university insertion and indicate that, sometimes, teaching is the result of professional contexts that are not necessarily focused on the exercise of the teaching profession by vocation. In answer 01, for example, the focus that some professors give on one activity or another of the teaching-research-extension tripod is elucidated, but that affinity does not always reach all these elements; answers 02 and 03 are illustrative of the choice of teaching either through frustrations with the business market, or through an idealized image of the teaching function, in which teaching is exacerbated as the essential university function.

Other possible causes of the fragile integration between the agents were related to the fragility of the local political system, the rationalities of the local external agents, the lack of knowledge and the question of the interests of the external agents. Some statements attribute the responsibility for the fragility of partnerships to the motivations that can lead external agents to look for universities - motivations that often do not agree with the ideological profile of the professor because it involves the exploitation of academic work to obtain political advantages, for example.

04: A mayor has only 4 years in office, so bureaucracy delays the process and prevents the mayor from completing the project, for example. *The lack of legislation for the government/university in case of a break in partnership, to protect the university and the company, the existence of clear rules so that future problems can be avoided, university needs to offer more autonomy for its agents* (Interviewed 16)

05: The main factors I see in relation to this... It's the government's own interest. We don't have a focus; I think there should be more focused actions within the federal government. What they really want behind research... *Their currency of exchange is, thus, what this will get them back. Because when you go to Brasilia, more or less, you have to make a survey of what population you are going to be covering in the research, what you are going to be raising, and how that could turn to them. So, I find it horrible.* I find it horrible because we need to show quality service to the population. I don't even like to go there and talk to them, to tell the truth, this disgusts me (Interviewed 11)

06: Regarding the company, the biggest difficulty for the company is that the company's budgets are not very high nowadays. Sometimes they are working correctly. So, they have to see the improvement of the company, as I explained to you. They really want to be working, partnering with the university ... *I have two companies that I worked with before coming here that had completely different concepts. While one was very easy to see the partnership as positive, the other could not see because it only saw partnerships as an expense. So, the difficulty is training the entrepreneur to see the benefits as well. He does not see; he just sees the expense, because it's not a tangible thing, numbers. Not too easy to show* (Interviewed 9)

Answers 04, 05 and 06 illustrate different scenarios and aspects that possibly directly influence the ability to develop partnerships between University and external agents. Aspects such as: **(a)** institutional weakness and lack of legal support to ensure the feasibility of the projects, given the changes of government in electoral periods; **(b)** the motivations that lead to seeking partnership actions. In relation to the latter, in the case of the government, the 'currency of exchange' (sic) would be the impacted population and the vote this would bring to the political agents. In the case of companies, it would be the immediate gain or the perceived short-term benefit to guarantee the

profit. Innovation and development are elements that have been ignored in the answers, so the concept that stands out in the answers is the cost-benefit of the partnership.

These findings have important practical implications for the University. In a first turn, it sheds light on the important issue of selection and career development. Their motivations that lead to teaching, as well as analysis of the profile of professionals, their aspirations and pretensions are important aspects that directly impact the entrepreneurial capacity to develop joint actions with the market and the government. Regarding the environment outside the University, a more functional look at its role is noticeable - as a service provider and producer of benefits. Respondents note that the interest of outside agents is not directly related to scientific progress, innovation or local development, but to the gain the University can provide by producing royalties at an appropriate cost.

Factors that constitute partnership stimuli

The scores obtained in Block 2 indicate that, although professors may be interested and see partnership as a stimulus to work, there is still no perception of an environment that is actively interested in institutional partnerships for development and innovation. The lowest scores relate to the University's incentive to develop these types of partnerships, while the highest scores relate to the professor's interest in participating in projects. Average scores are more related to the perception of the interest of external agents. The scenario, therefore, shows evidence of a predisposition on the part of respondents to be working with partners in joint projects (Table 5).

Table 5: Descriptive scores of questions from Block 1

Questions	Agreement Evaluation					
	N	Min	Max	Mean	Med	S.D.
Satisfaction when partnering	51	1	10	7.76	9.00	2.35
University incentive to partner with local business	51	1	10	4.49	4.00	2.49
University incentive to partner with local organizations - Third Sector	51	1	10	4.76	5.00	2.49
University incentive to partner with local government	51	1	10	5.16	5.00	2.54
Local Companies are interested in establishing partnerships with Universities	51	1	10	5.71	6.00	2.74
Third Sector local organizations are interested in partnering with Universities	51	1	10	6.08	6.00	2.75
Local government is interested in establishing partnerships with Universities	51	1	10	5.31	5.00	2.73
Professor's interest in participating in research projects that have partnerships	51	1	10	8.47	10.0	2.20
Professor's interest in participating in extension projects that have partnerships	51	1	10	7.86	9.00	2.62
Do you feel you could have more initiative for partnerships?	51	1	10	6.35	6.00	2.79
Do you feel that local business, Third Sector and government could take more initiative in partnering?	51	3	10	7.63	8.00	1.89
Do you know public policies that foster partnerships?	51	1	10	5.37	5.00	2.29
Do you feel yourself like an essential agent for local economic and marketing development?	51	1	10	6.75	7.00	2.71

Source: Research data, 2020.

The results indicate the understanding of respondents that, although they feel some satisfaction in the act of making partnerships (Mean = 7.76) in general, the institutional incentive at the University to make partnerships with local companies (Mean = 4.49), with local Third Sector organizations (Mean = 4.76) and government (Mean = 5.16) is still low. In this sense, it was also reported a low knowledge about policies that foster partnerships (Mean = 5.37).

Such results may be indicative of difficulties in relation to partnerships or frustrations for professionals who engage in the accomplishment of such tasks. This statement can be corroborated by the median score obtained in the question related to the feeling of being an essential agent for local economic and market development (Mean = 6.75).

The most attractive types of projects for professors are in the field of research (Mean = 8.47) and Extension (Mean = 7.86), respectively. Responsibility for the action initiative was more attributed to external agents (Mean = 7.63) than to professors themselves (Mean = 6.35), according to the respondents. These data indicate a susceptibility to the participation of projects, provided that the initiative comes from demands outside the University. In this sense, opening to partnerships would be on demand.

As reported in the interviews, possible reasons that weaken the establishment of partnerships are the alienation of external agents to research and work developed within the University, as well as the lack of support structure that enables the development of teaching work. Some reports have emphasized the need for outside agents to be curious or develop a habit of seeking information about the projects currently being developed.

07: I think university needs to stimulate us more, and also the company to seek us. *The company needs to know all the research that the university develops for the region, to seek these partnerships. It was reported that it is not the professor's competence to search for partnerships, but this must be done through the institution* (Interviewee 6).

08: Nowadays, the most difficult thing is the fundraising, both for equipment and for physical space. Because we got good money to buy equipment through this BNB project, but the thing is ... When that money comes and we buy this equipment, where are we going to put it? So, it's complicated, because we end up being demanded for research and extension, but the structure does not follow. In the public contest to enter the university, nobody told me that I would have to raise funds, maybe rely on the private initiative to build a space, that the idea we have to seek partnerships with private companies ... Because we have physical space, we don't have facilities inside this space! [hit the table with her hand, emphasizing this phrase] *The company sponsors the construction of this space and the university provides services to this company, because after all it is interesting for the company to know about the research we are developing in order to facilitate its processes* (Interviewee 3)

The analysis of answers 07 and 08 indicates difficulties of professors in relation to the bureaucracies and current structures for the accomplishment of projects, since professor must deal not only with the project leadership, but also with the procedures related to fundraising, management University's internal resources, among other things that make operations difficult. Similar reports were recurrent throughout the interviews. Participants say that awareness-raising work should be done with society so that the University is not seen as a space outside social dynamics, but an important partner in the development of private enterprise and government.

In addition, an important point was highlighted in the interviews: the excessive workload of professors in teaching activities, as well as the difficulties imposed by the management systems of universities. There were recurring reports of complaints related to the lack of preparation of professors to manage the procedures of research promotion projects, as well as the bureaucracies related to the administrative management of the documentation necessary for the realization and completion of the projects. This factor is seen as a great demotivator for partnerships and research and extension projects in local universities.

09: Another thing that could limit, sometimes, would be some overload that happens here at the University, *we professors have a very high workload, others have a lower one, so, if the teaching time is too high, that person ends up being limited to be able to perform other actions and to partner with other companies* (Interviewed 4)

10: I just ignore all the paperwork you have to do ... I had been here at UFMG for just one year, I went looking for what should be done to do it ... But it was so much paperwork, so much paper to fill out, such bad will ... No one wanted to explain. No one wants to show it. No one has an interest either. I gave up and I still do this project and this is not in my resume ... *Because the bureaucracy*

is so big. It's very big. I submitted to I do not know how many people, and people come there, do not understand what is the goal, think you will waste time ... So, I think this kind of judgment is not adding to the university and the students. Nor to the company within a local context. Since I didn't come from university, I came from the industry sector, so I think that people who come straight to university, they have a hard time seeing beyond themselves... (Interviewee 11)

Answers 09 and 10 raise questions about the distribution of the workload among teaching, research and extension activities, as well as reinforcing the difficulty encountered with bureaucratic procedures in projects. Such questions shed light on the important role that should be played by the University's administrative technostructure to support teaching work. Many professors reported having difficulty balancing teaching activities with others, and some testimonials stressed the issue that research and extension development carry large administrative burdens that hinder and worsen the cost-benefit of partnership development.

The findings of Block 02 shed light on two important questions: (a) the importance of integration and interest of external agents to the activities developed at the University, and (b) the importance of an administrative support structure that allows the dedication of the professor's work essentially within the scope of what he or she will develop as a promoter of partnerships and developmental research and extension projects. Partnerships can be enhanced if we consider an academic structure that values the support structure. The importance of the administrative support of universities was not directly brought by the interviews, but the bureaucratic and administrative obstacles related to projects and partnerships was reported as a major impediment and demotivation element among the respondents.

Conclusion

The Triple-Helix model is an important theoretical contribution that has aroused the interest of researchers for the relational character of economic development. Through its propositions, it is possible to think of a scenario of integration and innovation among essential agents for the functioning of contemporary modern society: the market, the government and the universities. However, its applicability still suffers from particularities related to the different and varied contexts in Latin America and Brazil.

Therefore, studying the applicability of the model and the particularities of each region can bring great conceptual richness to the model, contributing to a complex and realistic reading of the possibilities existing in each locality. This paper aimed, without the intention of generalizing results or transposing them to other realities, to analyze the integration dynamics between the helixes that comprise the model in the municipality of Montes Claros-MG, Brazil.

The results indicated a low integration among the agents, even if there is an indication of interest on the part of professors in the establishment of partnerships. Throughout the research, four practical questions emerged as important factors that influence the integration capacity among the agents in the referred context: fragility and lack of institutional support to guarantee legal stability for partnerships; professors' motivations regarding the development of joint projects with external agents; the need for interest from external agents in relation to the activities developed at the university and, finally, the importance of an administrative technostructure capable of providing support to professors.

An important factor that also emerged in this study was the question of the cost-benefit weighting of the agents in the integration dynamics. The absence of a joint political project, or a long-term view, can be seen as one of the factors that make partnerships difficult, as it has been stated that external actors seek direct and usually short-term benefits as gains from partnerships with universities. Often, these interests were considered incompatible with the ideological interests of the survey respondents. There is a dissonance regarding the purposes of the use of universities as a space for teaching, research and extension and about the role of professors.

As limitations of this research, we indicate the difficulty of accessing a large number of professors in the municipality. The low response rate of the questionnaires is indicative of this limitation. In this sense, as proposals for future research, we suggest the development of studies with a focus on specific realities of certain areas of knowledge (Administration, Law, Economics etc.), as well as more restricted territorial boundaries.

The results of this research cannot be generalized; however, they provide good perspectives on empirical dimensions to be tested in new environments. For this reason, we believe that their

contributions concern the enrichment of the discussion about the applicability and limitations of the Triple Helix model to the Brazilian context.

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