

INTERINSTITUTIONAL NETWORKS IN THE PERSPECTIVE OF THE TRIPLE HELIX: A CASE OF A SOUTH BRAZIL PUBLIC UNIVERSITY

REDES INTERINSTITUCIONAIS NA PERSPECTIVA DA HÉLICE TRÍPLICE: O CASO DE UMA UNIVERSIDADE PÚBLICA DO SUL DO BRASIL

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Recebido em 10/junho/2020

Aprovado em 09/novembro/2020

Publicado em 01/janeiro/2021

Sistema de Avaliação: *Double Blind Review*

Agência de fomento: CAPES - Coordenação de Aperfeiçoamento de Pessoal de Nível Superior



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ABSTRACT

This research aimed to analyze university actors' perception of inter-institutional partnerships, from a municipal public university's perspective, as a triple helix member. The qualitative approach was initially adopted, which consisted of mapping the inter-institutional partnership networks through agreements between companies, government, and University (triple helix). A quantitative approach based on Rodrigues's research was used; Esther and Andrade (2017) used descriptive analysis, multivariate technique (Cronbach's alpha, calculation of mean and standard deviation of dimensions) multicriterial utilizing the method of information entropy. The main results showed that in the perception of university actors, it is the University's role to offer teaching, research, and extension, to produce and disseminate knowledge; There is a lack of clarity among respondents as to whether the relationship between the University and the external environment may pose risks to the University. Moreover, it was found that the dimensions that obtained the highest scores on the scale were: "the reasons that lead the university to approach companies and governments" (Dim. 3), and "the purpose of the university to seek partnerships, under the perspective of resource dependence" (Dim. 4).

Keywords: University. Interinstitutional Partnerships. Triple Helix.

RESUMO

O objetivo dessa pesquisa consistiu em analisar a percepção dos atores universitários acerca das parcerias interinstitucionais, na perspectiva de uma universidade pública municipal, como membro da hélice tríplice. Para isto, adotou-se, em um primeiro momento a abordagem qualitativa, que consistiu em mapear as redes de parcerias interinstitucionalizadas por meio de convênios entre empresas, governo e universidade (hélice tríplice). Em seguida, utilizou-se uma abordagem quantitativa com base na pesquisa de Rodrigues; Esther e Andrade (2017), com o uso da análise descritiva, a técnica multivariada (*alfa de cronbach*, cálculo de média e desvio padrão das dimensões), e a multicriterial por meio da técnica de entropia da informação. Os principais resultados demonstraram que na percepção dos atores universitários é papel da universidade oferecer ensino, pesquisa e extensão, produzir e difundir conhecimento; há ausência de clareza entre os respondentes se a relação entre a universidade com o ambiente externo pode trazer riscos para a universidade. Além disso, verificou-se que as dimensões que obtiveram as maiores pontuações da escala, foram: “os motivos que leva a universidade a se aproximar de empresas e governos” (Dim. 3), e “o propósito da universidade buscar parcerias, sob a perspectiva da dependência de recursos” (Dim. 4).

Palavras-chave: Universidade. Redes Interinstitucionais. Hélice Tríplice.

1 INTRODUCTION

Universities are going through reengineering their processes to meet the market's new demands, society, and students. Thus, studies in the university management area have been gaining prominence in the field of administration. According to Schilickmann and Melo (2012), reengineering is necessary for universities, especially in public universities, as they present revenues that do not come from their productivity.

According to the authors, there is a distance between the courses offered and the market demands concerning society's needs. Students do not graduate with the skills required in their future area of expertise. In this sense, the university's utility is discussed, which should provide training aimed at the labor market (Schilickmann & Melo, 2012). Thus, the challenge is to rethink the university's structure, resulting in internal changes and new ways of partnering with the external environment. (Colombo, 2013; Meyer Jr, 2014). This is an alternative for universities to better respond to market pressures, operating in an interconnected system.

The establishment of cooperation networks between the University, companies, and development agencies, to make projects feasible allows for a constant approximation and updating of the academy with the market. In this relationship, everyone involved has gained. Often, companies see universities as an opportunity to meet their technological efforts as a competitive advantage source since there is a reduction in research development costs (Porto *et al.*, 2011).

The authors Melo (2002); Rodrigues, Esther and Andrade (2017) point out that the University, due to its contribution to the production of knowledge, has an innovation potential. In this perspective, according to Etzkowitz (1994), Etzkowitz and Leydesdorff (2000), Etzkowitz, Zhou and Chunyan (2017), the triple helix is a model composed of educational institutions, companies, and government for the promotion of innovation and economic development. According to Pfeffer and Salancik (1978), Ulrich and Barney (1984), Balestrin, Verschoore and Reyes (2010), organizations, when forming partnerships, have the purpose of sharing and having access to scarce resources.

From this perspective, the following research question was raised: what is the perception of university actors about inter-institutional partnerships, from the standpoint of a municipal public university, as a member of the triple helix? Universities have a relevant role

in society, so we seek to recover any complication in university actors' perception of this theme.

2 INTERINSTITUTIONAL NETWORKS AND TRIPLE PROPELLER IN STRATEGIC MANAGEMENT IN HIGHER EDUCATION INSTITUTIONS

As a study and practice field, educational management came from management principles, used initially in industry and commerce branches, mainly in the United States. Thus, its theoretical development occurred from the application of industrial models applied in educational contexts. As it became an academic field, theorists and managers in the area began to develop alternative models, based on their observations and experiences in educational institutions (Bush, 2006).

Reengineering at universities is necessary. In particular, public universities with revenues that do not come from their productivity. There is a massive gap between the courses offered and the demands of the market, about the needs of society. Academics, in general, do not graduate with the skills required in their future area of expertise. The "utility of the university" is discussed, which in turn, should provide a service that is useful for students whose objective is training aimed at the labor market (Schilickmann & Melo, 2012).

Universities have a relevant role in society; these institutions' performance needs more attention from researchers and university administration managers. Points arising from organizational complexity, which involves a university, which often has the ambiguity of objectives; the decision-making structure occurs in a collegial way; there is a plurality of interests; the essence of the educational process, mainly in the transfer of knowledge and learning, as well as the promotion of human values, has scarce resources and demand an appropriate administration and its theory (Meyer Jr, 2014).

In the current competitive scenario, in which higher education institutions are inserted, they must seek new ways of acting and improving the quality of educational services to obtain performance and value from the services offered. Management with leadership and determination must operate in more flexible structures aimed at consumers and processes to this end. Thus, the challenge is to rethink its construction, resulting in internal changes and new external engagement ways. (Colombo, 2013; Meyer Jr, 2014).

An alternative is a possibility for educational institutions to better respond to market demands, operating in an interconnected system. The concept of institutions with this understanding can have a significant effect on the existing contingencies about organizations.

The author Weick (1976) in the 1970s already indicated the development of conceptual instruments, which preserved the interconnected systems, such as: talking about the existing elements in educational institutions that can be integrated; the development of a contextual methodology; the collection and description of structures for an interconnected system; the specification of the fundamental technology for educational institutions (Weick, 1976).

In this sense, the formation of cooperation networks between universities, companies, and development institutions to make projects feasible contributes to the approximation and constant updating of the academic community with the market. In this relationship, everyone involved has gained. "The motivations that lead to cooperation are different for universities and companies, as well as their characteristics and needs, the intersection of which is in need to innovate." (Porto *et al.*, 2011, p. 53).

According to Porto (2006), universities are seen as a receptacle of knowledge, whose access occurs through partnerships, licensing, qualification of their actors, and research development. Commonly, organizations see universities as a means of supplementing their technological effort, as a source of competitive advantage with the reduction of research costs. , organizations have limited internal resources (qualified professionals and financial resources) for the production of research.

Universities seek to meet the needs of the market due to the University's sense of usefulness. This reinforces the tendency to reengineer to models and organizational processes, as Schilickmann and Melo (2012) highlighted. It should be noted that, due to its contribution to the production of knowledge, the University has the potential for innovation (Melo, 2002; Rodrigues Esther & Andrade, 2017).

In this perspective, the triple helix is a model that integrates educational institutions, companies and government to foster innovation and economic development (Etzkowitz, 1994; Etzkowitz & Leydesdorff, 2000; Etzkowitz, Zhou & Chunyan, 2017). The term was originated metaphorically, and the purpose was to identify those involved in an innovation system (regional scope), a particular route in the United States of America. The term triple helix is currently internationally recognized in guiding innovation practices and policies at local to global levels. The goal is to improve "university-industry-government interactions." (Etzkowitz & Zhou, 2017, p.23).

This model is a means to improve the conditions of innovation in a knowledge-based society. In this arrangement, the industry is seen as the place of production; the government is

a source of contractual relations that had ensured the stability of interactions, and the University produces new knowledge and technology. These interrelations are the generating principle of knowledge-based economies (Etzkowitz, 2003).

Still, according to Etzkowitz and Zhou (2017, p. 23) from the perspective of the triple helix, "the University is no longer playing a secondary social role, albeit an important one, in providing higher education and research, and it is assuming a primordial role equivalent to that of industry and government, as a generator of new industries and companies."

Etzkowitz (1994) clarifies that the triple helix makes it possible to raise resources external to the university and the government. It is possible to count on the private initiative for the source of project financing. Based on this premise, the study by Rodrigues, Esther, and Andrade (2017, p.02) sought "to understand what is being done in the structuring of this relationship, raising, for this, the specific situation of a Brazilian university." The results demonstrated a consensual absence about the institutional actors' posture and vision regarding the University's relationship with the external environment.

Although there was no consensus in the results of Rodrigues' research; Esther and Andrade (2017) regarding the University's relationship with the external environment, the authors recognize the importance of the relationship between the University, government, and company, acting in a cooperation network, to obtain resources, since there is a dependence on resources of these institutions.

Concerning resource dependence, this is an approach used in studies on cooperation networks. The point of interest is understanding how organizations decrease their reliance on the environment, using different strategies to increase their power. This theory details the types of resource dependence, whether material or immaterial, as potential determinants in network formation.

In this sense, the seminal article by Pfeffer and Salancik (1978) stands out; Ulrich and Barney (1984); Balestrin, Verschoore and Reyes (2010) review some of the main configurations of cooperation networks and social networks. From the perspective of resource dependency theory, organizations are structured in networks to share and access scarce resources.

The resource dependency theory, according to Penrose (1959), Teece (1982), Prahalad and Bettis (1986), Barney (1991), Clegg et al. (1999), has as its fundamental unit of analysis

the resources and capacities controlled by the company. This includes all the attributes that enable the company to define and implement strategies.

Resources can be divided into financial, physical, human, and organizational (Barney, 1991; Clegg et al., 1999). The perspective of resource dependence is based on two assumptions regarding the company's resources and capabilities. The first assumption is that resources and capacities can vary significantly between companies. The second assumption assumes that these differences can present stability, considering resources' immobility (Clegg et al., 1999).

3 METHODS AND TECHNIQUES OF RESEARCH

This section describes the methodological framework of the research and the procedures for collecting and analyzing the data.

3.1 METHODOLOGICAL FRAMEWORK

To analyze the perception of university actors about inter-institutional partnerships, from the perspective of a municipal public university, as a member of the triple helix, the qualitative approach was adopted, at first, which consisted of mapping the networks of inter-institutionalized partnerships through agreements between companies, government and University (triple helix).

To map the projects financed by these partner institutions and the University, it was necessary to contact the University's project office, establishing the cooperation contracts, and managing the invested resources. The university's NIT (Technological Innovation Nucleus) was then contacted to survey and understand how private companies' recruitment and contractual feasibility occurs. Lastly, the Postgraduate Division was sought so that it was possible to survey research resources (scholarships, extension) and its distribution to graduate programs.

In this way, it was possible to constitute the database. This was composed of 119 professors/researchers linked to Postgraduate programs (Stricto Sensu), the rector, three pro-rectors (administration, research, and extension, teaching), three managers of the administrative units directly linked to inter-institutionalized partnerships. It was totaling 126 participants. After mapping the inter-institutionalized partnerships and the university actors

involved, it was necessary to use a quantitative approach to treat the data, using descriptive, multivariate, and multicriteria techniques.

The quantitative approach aims to measure phenomena, including collecting and analyzing numerical (quantitative) data, and performing statistical tests. The relevant factor for validating quantitative studies is provided through statistical indicators' reliability (Collis & Hussey, 2013). The descriptive research technique often characterizes some contextual situation, which is idealized to measure research cases' characteristics (Hair Jr et al., 2009).

The multicriteria method is a systematic analysis that seeks to identify, characterize, and classify the main constituent factors by comparing the variables proposed in the criteria set. The aim is to offer possible alternatives for the group's preferences involved in the decision-making process (Matzenauer, 2003; Gomes; Araya & Carignano, 2004; Stewart, 2011; Almeida, 2013).

In this second part, an adapted questionnaire was adopted, based on Rodrigues, Esther and Andrade (2017), which initially had a qualitative approach, and the instrument consisted of interviews with university actors. The data collected were categorized using the frequency counting technique, and the variables most cited by the interviewees were organized into three dimensions, described in Chart 1. For this article, Rodrigues, Esther and Andrade (2017) identified the three dimensions of the research, and a fourth dimension was created, named: Partnerships - The Resource Dependency Perspective.

To measure the questions (Chart 1), a 7-point Likert scale was used, with 1 attributed to the respondent's total disagreement and 7 to the respondent's entire agreement with the statements that composed the questions. The structured questionnaire was made available via Google Docs between February and March 2018. All university actors identified in the first part of the survey were invited to participate in the survey. The survey ended on March 28, 2018, with the participation of 43 respondents.

Then, the data were tabulated in a Microsoft Excel® spreadsheet. The questions were grouped according to the proposed dimensions (Chart 1). The Microsoft Excel® spreadsheet database was imported into SPSS® Statistical Software version 22. The first analysis performed was the statistical reliability test (Cronbach's alpha). This indicator measures reliability that varies from 0 to 1, with values from 0.60 to 0.70 being considered the lower limit of acceptability (Hair Jr. *et al.*, 2009). Then, the mean and standard deviation of the dimensions were calculated.

Table 1 Relationship between research questions and questionnaire items

| DIMENSIONS | RESEARCH QUESTION | QUESTIONNAIRE ITEMS |
|--|---|---|
| D1 - The roles of the University. | The roles that the University currently assumes are: | <ol style="list-style-type: none"> 1. The triad: Teaching, Research, and Extension. 2. In addition to the triad, also innovation and visualization of external demands. 3. Meet the triad, but that is below its possibilities. 4. It is an agent of economic and social development. 5. It is a producer and disseminator of knowledge. 6. Reflection on the ideal role and the real role of the University. |
| D2- Risks: University and the external environment. | Possible risks for the University in a closer relationship with the external environment: | <ol style="list-style-type: none"> 7. There are no risks for the University. 8. Divert the focus from your public purposes to meet private demands. 9. Risks depend on how this relationship is regulated. 10. The University is at risk of entering the burden, and the companies are left with the bonus. 11. Prioritize only the connection with some sector of society, such as Companies. 12. Benefits only for areas with greater affinity and consistency with market demands. |
| D3 - Approaching the University with Business and Government: Motivations. | Reasons that would lead the University to seek closer relations with the government and companies: | <ol style="list-style-type: none"> 13. Obtaining financing in the private sector. 14. Contribute to economic and social development. 15. Achievement of social legitimacy approaching society. 16. Provide more significant insertion of students in the market. 17. Approximation of the object of study and greater applicability of knowledge. |
| D4 – Partnerships: the Resource Dependency Perspective. | Reasons that would lead the University to seek partnerships with the government and companies, from the perspective of resource dependence: | <ol style="list-style-type: none"> 18. Obtaining financial resources in the private sector. 19. Obtaining financial resources in the public sphere. 20. Obtaining resources for the acquisition of equipment, laboratories, etc. 21. Obtaining resources for university actors qualification (qualification: courses, participation in congresses in the area, etc.). 22. Obtaining resources for hiring specialized professionals (intern: hiring hours at the University). 23. Obtaining resources for hiring specialized professionals (external: hiring third parties). 24. The use of funds raised (private initiative) is used in other university projects. 25. The use of funds raised (public area) is used in other university projects. 26. The funds raised for one project constitute a starting point for other university projects. 27. The funds raised through the agreements reflect the innovation of the University's processes (teaching, research, and extension). 28. The University's performance is superior (maintaining competitive advantage) due to obtaining these resources through agreements/partnerships with the private and public initiative. |

Source: adapted from Rodrigues; Esther and Andrade (2017).

Subsequently, a multicriterial analysis of information entropy was performed. This method is used to determine the evaluated indicators' weight (Zeleny, 1982; Zou; Yi & Sun, 2006). The term entropy originally came from thermodynamics, and over time it has been used in other areas of knowledge, such as the social sciences (Rocha *et al.*, 2011). For the entropy calculation, a reference point was necessary: an anchor value about the value at which the information's entropy is calculated. In this research, the assigned value was 7 (Totally Agree). In this way, the entropy value will recommend how much information is present in each question of the research instrument used (Zeleny, 1982; Rocha *et al.*, 2011).

Feasible, we sought to verify the variability in the answers regarding the agreement and disagreement of the attributes (questions). According to Zeleny (1982) and Rocha *et al.* (2011), the following model was applied mathematically: $d_i = (d_i^1, d_i^2, \dots, d_i^m)$ normalized values, in which: $d_i^k = \frac{x_i^k}{x_i^*}$, characterizing the set D, in the form of an i-ésimo attribute. It is defined: $D_i = \sum_{k=1}^m d_i^k$; $i = 1, 2, \dots, n$. The entropy measure of the intensity contrast for the i-th attribute is calculated by $e(d_i) = -\alpha \sum_{k=1}^m \frac{d_i^k}{D_i} \ln \left(\frac{d_i^k}{D_i} \right)$, wherein $\alpha = \frac{1}{e_{max}} > 0$ e $e_{max} = \ln(m)$. Recalling further that $0 \leq d_i^k \leq 1$ e $d_i^k \geq 0$. In the event of all k i d are identical for a given i, in such a case $\frac{d_i^k}{D_i} = \frac{1}{n}$ e $e(d_i)$ admits maximum value, that is, $e_{max} = \ln(m)$. Fixing $\alpha = \frac{1}{e_{max}}$ is called $0 \leq e(d_i) \leq 1$ for all d_i 's. Such normalization is essential for comparison purposes. The total entropy of D is determined by $E = \sum_{i=1}^n e(d_i)$.

Because of the weight λ_i^{\sim} be oppositely concatenated to $e(d_i)$ It used $1 - e(d_i)$ on the contrary $e(d_i)$ and normalized to ensure that $0 \leq \lambda_i^{\sim} \leq 1$ e $\sum_{i=1}^n \lambda_i^{\sim} = 1$. Thus, we have:

$$\lambda_i^{\sim} = \frac{1}{n-E} [1 - e(d_i)] = \frac{[1 - e(d_i)]}{n-E}.$$

4 PRESENTATION AND ANALYSIS OF RESULTS

This chapter presents and discusses the research results, starting with the statistical reliability test (Cronbach's alpha). The descriptive statistics (mean, the standard deviation of the dimensions, ranking) and multicritical analysis of the dimensions' entropy calculation are presented.

Table 1 Reliability statistics

| Cronbach's alpha | N of items |
|------------------|------------|
| 0,866 | 28 |

Source: research data.

As can be seen in Table 1, the value obtained was 0.866. With this data, it is possible to infer that the research instrument (questionnaire) adapted by Rodrigues, Esther and Andrade (2017) has excellent reliability for all 28 items.

Table 2 Mean and Standard Deviation of Dimensions

| Dimension | Average | Standard deviation |
|--|---------|--------------------|
| Dim. 1 - The roles of the University | 5,34 | 1,28167 |
| Dim.2 - Risks: University and the external environment | 3,99 | 1,92183 |
| Dim.3 - Approx. University with Business and Government: Motivations | 6,05 | 1,34100 |
| Dim. 4 - Partnerships: the Resource Dependency Perspective | 5,44 | 1,57109 |

Source: research data.

Table 2 shows that in the perception of the university actors surveyed, the university's role is to offer teaching, research, and extension to produce and disseminate knowledge (Dim. 1). Besides, there is no clarity among respondents about whether the University's relationship with the external environment can promote its risks (Dim. 2).

The dimension that obtained the highest score were the reasons that lead the University to approach companies and governments: receive financial resources, contribute to economic and social development and provide the more significant insertion of students in the market. (Dim. 3). Dimension 4 obtained the second-highest score on the scale and refers to the University's purpose of seeking partnerships from resource dependence.

Regarding the University's motivation to approach the other members of the triple helix (company and government), forming a cooperation network, according to Porto et al. (2011), is the feasibility of projects, which, in turn, contribute to the approximation and continuous updating of academics with the market. In this relationship, everyone involved in the triple helix has gained. "The motivations that lead to cooperation are different for universities and companies, as well as their characteristics and needs, the intersection of which is in need to innovate." (p. 53).

In Table 3, a ranking was performed, based on the frequency count of the questions obtained a higher score for each dimension (Likert 7). It is possible to verify that the question that got the highest score on the scale was Q 20, of dimension 4, which refers to "Obtaining

resources for the acquisition of equipment, laboratories, etc..” 65.1% of respondents realize that through obtaining external resources, it is possible to purchase equipment and set up laboratories at the University. In this regard, Etzkowitz (1994) points out that the triple helix makes it possible to obtain external resources for the university and government. Therefore, partnerships with private companies are made possible as a source for project financing. Then, the entropy of the information for each component or item was calculated (Table 4).

Table 3 Ranking of questions with the highest score, by dimension.

| Dimension | Questions | Likert | Frequency |
|-----------|-----------|--------|-----------|
| D1 | Q1 | 7 | 55,8% |
| D3 | Q13 | 7 | 53,5% |
| D3 | Q14 | 7 | 51,2% |
| D3 | Q17 | 7 | 55,8% |
| D4 | Q18 | 7 | 55,8% |
| D4 | Q19 | 7 | 62,8% |
| D4 | Q20 | 7 | 65,1% |

Source: research data.

Table 4 Information Entropy

| VARIABLES | | ENTROPY E(D _i) | WEIGHT |
|-------------|-----------|----------------------------|-----------|
| Dimension 1 | D1-Q1 | 0,025451 | 0,166544 |
| | D1-Q2 | 0,016749 | 0,168031 |
| | D1-Q3 | 0,031641 | 0,165486 |
| | D1-Q4 | 0,023592 | 0,166862 |
| | D1-Q5 | 0,022994 | 0,166964 |
| | D1-Q6 | 0,027969 | 0,166114 |
| Dimension 2 | D2-Q7 | 0,013648 | 0,168155 |
| | D2-Q8 | 0,021666 | 0,166788 |
| | D2-Q9 | 0,021443 | 0,166827 |
| | D2-Q10 | 0,023975 | 0,166395 |
| | D2-Q11 | 0,02178 | 0,031773 |
| | D2-Q12 | 0,166769 | 0,165065 |
| Dimension 3 | D3-Q13 | 0,025947 | 0,199174 |
| | D3-Q14 | 0,020202 | 0,200349 |
| | D3-Q15 | 0,020497 | 0,200289 |
| | D3-Q16 | 0,02003 | 0,200384 |
| | D3-Q17 | 0,022866 | 0,199804 |
| Dimension 4 | D4-Q18 | 0,0254509 | 0,0907916 |
| | D4-Q19 | 0,0251767 | 0,0908171 |
| | D4-Q20 | 0,0251092 | 0,0908234 |
| | D4-Q21 | 0,0266179 | 0,0906828 |
| | D4-Q22 | 0,0286135 | 0,0904969 |
| | D4-Q23 | 0,0234158 | 0,0909812 |
| | D4-Q24 | 0,0214426 | 0,0911650 |
| | D4-Q25 | 0,0215258 | 0,0911572 |
| | D4-Q26 | 0,0193058 | 0,0913641 |
| | D4-Q27 | 0,0224174 | 0,0910742 |
| D4-Q28 | 0,0270077 | 0,0906465 | |

Source: research data.

After running the mathematical model, used to calculate the entropy of information for each question raised in the instrument applied for this study (Table 4), it was found that the most relevant information is present in Dimension 3, “Approaching the University with Business and Government: Motivations,” according to the respondents, were: D3Q14 “Contribute to economic and social development.” (20.03%) and D3Q16 “Provide greater insertion of students in the market.” (20.03%). The question that there was less information (9.05%) was D4Q22 “Obtaining resources for hiring specialized professionals (internal: leasing of hours at the university).”

Analyzing this dimension's data, it is clear that the respondents consider the university's approximation with business and government to be necessary. They understand that this relationship can promote a more significant insertion of students in the professional performance market. Also, it contributes to economic and social development through the production of research that encourages solutions demanded by companies. This data corroborates Etzkowitz (2003); for the author, the proposal of an arrangement between University, company, and government, improves the conditions of innovation in a society based on knowledge, and the University produces new knowledge and technology.

Organizations give universities a way to supplement their technological commitment as a source of competitive advantage by reducing research costs. The companies have limited internal resources (qualified professionals and financial resources) for the production of research. In this way, universities are considered a receptacle of knowledge. Partnerships are a way for those involved to access each member's resources (triple helix) has. Companies see universities as an opportunity for technological supplementation, as a source of competitive advantage, mitigating research costs (Porto, 2006).

Regarding the first dimension, “The University Papers,” composed of Q1, Q2, Q3, Q4, Q5, and Q6 of the instrument by Rodrigues, Esther and Andrade (2017), there was a homogenization of responses. In other words, the six questions present in this dimension have an average of 16% of information (variations between 16.54% and 16.83%), with no marked variability between them. This factor deals with the triad of teaching, research, and extension; innovation and visualization of external demands; economic and social development agent; producer and disseminator of knowledge.

As can be seen, the roles perceived as belonging to the University are related to the activities inherent to its conception. According to Meyer Jr. (2014), universities have an

essential role in society. For Porto (2006), universities are seen as a reservoir of knowledge. According to Melo (2002); Rodrigues, Esther and Andrade (2017), the university's role as a member of the triple helix is vital due to its contribution to the production of knowledge to enhance innovation.

As for dimension two, it deals with the possible risks of the University's interaction with the external environment: D2Q7 "There are no risks for the university" (16.81%). Questions D2Q8 to D2Q11 showed few variations (percentage of explanations between 16.63% to 16.68%) refer to the University diverting its focus from its public purposes to meet private demands; the risks depend on how this relationship is regulated; the risk of the University entering the burden and the companies taking the bonus; prioritize only the connection with some sector of society, such as companies. The question D2Q12 "Benefits only for areas with greater connection and coherence with market demands," presents an even lower percentage, of 16.50%. Just as it was possible to observe in Table 2, it is interesting to note that in this dimension, the respondents' lack of clarity regarding the potential risks that the University may be liable to interact with within the external environment is evident.

Finally, dimension four, "Reasons that would lead the university to seek partnerships with the government and companies, from the perspective of resource dependence," despite obtaining the second-highest score on the scale (Table 2), presented less information, according to Table 4. It can be inferred that this data is because there was less variability in the responses and that a higher percentage was concentrated in the value 7 of the Likert scale, showing a more remarkable agreement with the assertions presented.

5 CONCLUSIONS

In this study, the main objective was to analyze university actors' perception about inter-institutional partnerships from a municipal public university's perspective, as a member of the triple helix. The results show that in the perception of university actors, the university's role is to offer teaching, research, and extension to produce and disseminate knowledge (Dim. 1). It was also found that there is no clarity among the respondents if the relationship between the University and the external environment can bring risks to the University (Dim. 2). This data differs from the result found in the research by Rodrigues, Esther and Andrade (2017). Most do not see risks for the University in the interaction with the external environment.

Two dimensions obtained the highest scores on the scale, which were “the reasons that lead the university to approach companies and governments” (Dim. 3), and “the purpose of the university to seek partnerships, from the perspective of resource dependence” (Dim. 4). The University's motivation to approach other triple helix members occurs by obtaining financial resources and by the contribution that this relationship reflects in economic and social development and providing more significant insertion of future professionals in the market. This data confirms the understanding of Etzkowitz (2003). According to the author, the proposal for a cooperation network between University, company, and government, improves the conditions of innovation in a knowledge-based society, and the University produces new knowledge and technology.

The dimension that obtained the second-highest score on the scale, but presented the least variability among respondents, suggesting a more remarkable agreement with the proposed statements, was dimension 4. This deals with the reasons that lead the University to seek partnerships with the government and resource dependence. This dimension presented less information, according to the multicriteria analysis.

Finally, it is expected that the present study will encourage future research, such as applying the instrument on interinstitutional partnerships from the perspective of the triple helix in other universities. Thus, it is suggested to expand the sample to verify university actors' perception about this theme, to verify possible extrapolations in another context. The replication of this research also supports the development of the study field because of the scarcity of empirical studies on inter-institutional partnerships and the dependence on resources as a triple helix member. Research in this area can help foster social, economic, local, and country development.

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