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PROPOSAL TO IMPROVE PARTNERSHIPS BETWEEN THE PRIVATE SECTOR AND FEDERAL UNIVERSITY OF TRIÂNGULO MINEIRO

PROPOSTA DE MELHORIA DAS PARCERIAS ENTRE O SETOR PRIVADO E A UNIVERSIDADE FEDERAL DO TRIÂNGULO MINEIRO

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RESUMO

A proposta do presente estudo é investigar dificuldades no estabelecimento de parcerias de Pesquisa, Desenvolvimento e Inovação (PD&I) entre o setor privado e a Universidade Federal do Triângulo Mineiro (UFTM). De início, o processo atual de parcerias de PD&I com o Núcleo de Inovação Tecnológica (NIT) foi mapeado e dois questionários foram aplicados, respectivamente, aos pesquisadores da universidade e às empresas do setor privado atuantes em Uberaba-MG. Os resultados evidenciaram que os participantes apresentaram um nível de conhecimento médio a pouco quanto aos incentivos à interação universidade-empresa previstos na legislação por meio do Marco Legal da Ciência, Tecnologia e Inovação. Além disso, 55,9% das empresas investigadas estavam interessadas em desenvolver projetos de PD&I com a universidade supracitada, enquanto 44,1% delas não estavam. Quanto aos fatores que dificultam o estabelecimento de parcerias, os participantes expressaram um baixo conhecimento sobre os procedimentos e mencionaram uma excessiva burocracia. Quanto maior o relacionamento com a universidade, maior foi a burocracia percebida. Por fim, melhorias foram sugeridas para encorajar parcerias na universidade e para desenvolver procedimentos tanto para a proposição quanto para a formalização de acordos entre o setor privado e a UFTM.

Palavra-Chave: Inovação. Parceria. Interação Universidade-Empresa. Pesquisa; Tecnologia.

ABSTRACT

The aim of the current study is to investigate difficulties in establishing Research, Development and Innovation (RD&I) partnerships between the private sector and Federal University of Triângulo Mineiro (UFTM). Initially, the current process of RD&I partnership agreements with the Technological Innovation Center (TIC) was mapped and two questionnaires were applied, respectively, to researchers at the university and to private sector companies operating in Uberaba City-MG. Results have evidenced that participants presented medium-to-poor level of knowledge about incentives to university-company interactions provided for the legislation through the Legal Framework for Science, Technology and Innovation. In addition, 55.9% of the investigated companies were interested in developing RD&I projects in partnership with the aforementioned university, whereas 44.1% of them were not. With respect to factors making it hard to establish partnerships, participants have mentioned poor knowledge about procedures and excessive bureaucracy. The greater their relationship with the university, the more bureaucracy was perceived by them. Finally, improvements were suggested to encourage partnerships at the university and to develop procedures for both proposing and formalizing partnership agreements between the private sector and UFTM.

Keyword: Innovation; Partnership. University-Company Interaction. Research; Technology.

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1 INTRODUCTION

Acknowledging the importance of setting partnerships between public universities and the production sector enabled a more up-to-date view of the role played by these actors in the country's economic and social development processes. Brazilian public research institutions are the main centers for knowledge and scientific research production and promotion, since a large number of researchers with expertise in different knowledge fields account for a significant share of intangible assets generated in these science and technology institutions (Ito Junior, 2016). Companies, in their turn, benefit from this knowledge to obtain more competitiveness, to encourage economic circulation, as well as to provide new products/services to meet customer demands in a society increasingly eager for innovation (Berni *et al*., 2015).

Several countries have sought to develop mechanisms to bring together what is produced in academia and market demands. At national level, Law n. 10.973/2004, also known as Innovation Law, is one of the regulatory frameworks of the national innovation policy focused on promoting scientific and technological research in the production sector to enable professional qualification, technological autonomy and the country's industrial development (Brasil, 2004).

Thus, efforts have long been made to encourage cooperative research through the advancement of legal instruments. The new Legal Framework for Science, Technology and Innovation - established by Law n. 13.243, from January 11, 2016 and later regulated by Decree n. 9.283, from February 7, 2018 - brought along great progress in this perspective. However, despite advancements in the current legislation, it is still necessary overcoming challenges in bureaucratic procedures adopted by public Science, Technology and Innovation (STI) institutions in order to achieve the desired collaborative environment.

Several studies described bureaucracy as one of the difficulties faced in this relationship (Ribeiro; Alves, 2019; Miranda *et al*., 2019). However, studies focused on finding ways to remedy this problem remain scarce in the literature. Thus, in order to meet UFTM's need of setting procedures to make partnerships easier, to help overcoming bureaucratic challenges and to promote collaborative practice in the institution.

Brazilian public universities play fundamental role in national scientific and technological knowledge. Moreover, they are a great pillar for innovation processes, since they have an entire cutting-edge multidisciplinary scientific infrastructure, as well as count on

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human resources formed by highly qualified researchers. Thus, they perform an essential State function towards society, since they support national research - the more aligned it is with the economic sector, the greater the country's growth (Tosta, 2012).

The interaction among production sectors, the government, and educational and research institutions must focus on consolidating ongoing relationships and on proposing effective ways to improve quality and productivity, besides helping Brazilian society in the extremely competitive market dominated by developed countries (Alessio, 2004).

The relationship between universities and companies is essential to enable the construction of an effective innovation system, since actions taken by different institutional spheres result in the formation of this system (Cerrón, Meirelles, Esteves, 2008; Nunes *et al.*, 2011).

Accordingly, the Triple Helix model - which was a concept defined by Etzkowitz and Leydesdorff, back in the 1990s – focuses on the interaction among university, government and industry/company as a means of developing new organizational models of technological innovation, as well as vital strategies for regional development. Moreover, it favors the generation of both intellectual capital and wealth in the country (Ranga; Etzkowitz, 2013).

This concept places the university at a level equivalent to that of the industry and government, since it takes primary role as source of entrepreneurship, technology and innovation (Etzkowitz; Zhou, 2017). The government accounts for providing the means of encouraging and setting partnerships based on public development policies focused on promoting science, technology and innovation activities. Companies, in their turn, incorporate innovation in their organizational culture as business strategy to generate economic value and market competitiveness (Brandão Neto; Oliveira, 2010).

Constitutional Amendment n. 85/2015 enabled a new scenario for science, technology and innovation activities in Brazil. It gave the State a clearer role in issues associated with innovation, such as encouraging partnerships among the State (in its different spheres), the academia and the private sector, as well as introducing mechanisms to enable research activities (Brasil, 2019).

The constitutional change opened room for the emergence of new legal instruments - this recent set of standards became known as the Legal Framework for Science, Technology and Innovation (MLCTI - Marco Legal da Ciência, Tecnologia e Inovação) - with emphasis on the aforementioned Amendment, on Law n. 13.243/2016, which amended Law n.

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10.973/2004 and 8 other laws, and on Decree n. 9.283/2018, which has federal scope (Brasil, 2019).

The MLCTI provided more clarity to both the application and operationalization of the Innovation Law, since it strengthened mechanisms focused on encouraging partnerships between scientific/technological institutions and companies in innovative activities associated with the production segment. Among the participation forms specified in its articles, one finds: sharing or permission to use laboratories and STI facilities by companies (art. 4); provision of technical services to private institutions (art. 8); and partnership agreements in research and technological development activities (Rauen, 2016).

Accordingly, the UFTM Innovation Agency linked to the Dean of Post-Graduation Research (also known as PROPPG) focuses on meeting the current Brazilian innovation policies' demands and on encouraging entrepreneurship, with emphasis on its primary purpose of using scientific, technological and cultural knowledge produced at the Institution on behalf of development (UFTM, 2020).

Within this scenario, the Technological Innovation Center (also known as TIC) is an important agent accounting for bringing the research institution and the industrial sector closer to one another, as well as for adopting strategies and guidelines provided for in Public Policies focused on Technological Innovation to truly meet the university, private sector and society's demands (Cruz *et al*., 2020).

Therefore, the aim of the current study was to contribute to the improvement of Research, Development and Innovation partnership processes between the private sector and Federal University of Triângulo Mineiro.

2 METHODOLOGY

This is research is based on a qualitative and analytical quantitative approach, as well as on a observational and exploratory nature regarding the objectives (Fontelles *et al.*, 2009).

According to Minayo (2004, p. 17), "nothing can be a problem, in intellectual terms, if it has not been a problem in practical life, in the first place". From this perspective, the herein developed research is featured as exploratory, since it provides greater familiarity with this topic and makes it more explicit through the application of the herein selected data collection instrument to participants who had practical experience with the investigated problem (Gil, 2002).

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From the approach perspective, the current research has a qualitative and quantitative nature, since it helps better understanding specific and complex social phenomena through interpretations, based on its ability to determine associations between variables and to observe the frequency at which a given fact or phenomenon takes place to help disclosing its nature and its association with other phenomena. This feature enables it to be recommended for planning actions susceptible to generalization (Fontelles *et al.*, 2009).

Data from primary sources obtained through the analysis of documents available at the Technological Innovation Center (TIC), as well as through a web survey questionnaire comprising structured questions and developed in the Google GSuite forms tool, were used in the current study.

It is also worth emphasizing data collection carried out through TIC's participation in meetings and conversations held with the server team, since the exchange of information substantiated the construction of this proposal to improve procedures aimed at setting partnership agreements.

Thus, the current research started with the process to survey the investigated problem in the agency accounting for mediating the university-company relationship and with the identification of difficulties faced by these entities, based on consultation with participants directly involved in this relationship, i.e., UFTM researchers and companies.

The University of Triângulo Mineiro, which is a Federal Institution linked to the Ministry of Education, was the herein selected study site. It is a self-sufficient institution whose headquarter is located in Uberaba City-MG; it also has a campus in Iturama City-MG. UFTM offers courses in the most diverse knowledge fields, which comprise approximately 8,600 students distributed in undergraduate (engineering, health and degrees), post-graduation and professional training courses (UFTM, 2019).

A survey on partnerships with the private sector was initially performed. Then, the current procedure adopted to formalize scientific and technological partnerships focused on innovation, through the UFTM Technological Innovation Center, was mapped.

2.1 POPULATION AND SAMPLE

By having in mind the herein selected object of study, we first sought to get a list of private sector companies operating in Uberaba City. Given the difficulty in obtaining a list of these companies, per segment, in the competent agencies, the Company Questionnaire was

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sent to representatives and/or managers of production and technological companies operating in Uberaba City/MG – these companies were identified based on their installation in Uberaba City's industrial districts and on general knowledge about companies located in it. Furthermore, the questionnaire was promoted in companies belonging to the industrial sector, which were associated with the Federation of Minas Gerais State's Companies (Fiemg - Federação das Indústrias do Estado de Minas Gerais) - Vale do Rio Grande Regional Headquarters - and sent to representatives of all 40 companies highlighted by the Economic Development Secretariat of Uberaba City–MG (PMU, 2020).

Thus, 20 investigated companies are located in Industrial Districts I, II, III and in the Business Park, besides other companies belonging to the production sector in Uberaba City/MG - 34 questionnaires were completed, in total.

It is worth emphasizing difficulties faced in the process to get responses from companies, such as contact difficulty and dependence on authorization from headquarters and/or other sectors, such as the legal sector. Furthermore, some companies reported exclusively-operational functioning in Uberaba City.

Next, the universe of researchers was defined based on a survey conducted to find the number of professors at UFTM. It was done through consultation carried out on the Institution's website (UFTM, 2021), which resulted in the total number of 640 professors, distributed in the University Campus of Iturama City and in the Professional Education Center (Cefores - Centro de Educação Profissional).

The list of UFTM professors, per institute, and in the University Campus of Iturama City, which was updated on April 07, 2021, totals 612 professors: 568 professors are distributed in the following 5 institutes: ICBN (55), ICENE (69), ICS (213), ICTE (131) and IELACHS (100); whereas 44 professors work in the University Campus of Iturama City. The list of Cefores' professors updated on March 03, 2020 enabled adding 28 professionals to the investigated sample.

Subsequently, sample size was calculated based on using the formula applicable to finite population, at 95% confidence level and 5% margin of error. The necessary sample size of 240 professors was herein obtained based on using the proportional stratified probabilistic technique. Therefore, the UFTM Research Questionnaire was sent to the universe of 640 professors at the university, which comprised researchers working in different academic units

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of the Institution (Institutes, Cefores and University Campus of Iturama), in order to get 240 sample responses.

The script of the interview structured for the Company Questionnaire comprised the following factors: age (in years); time working in the company (in years); sex (female / male / prefer not to inform); knowledge level assessment based on scientific development, research, scientific and technological training and innovation resulting from the Legal Framework for Science, Technology and Innovation; assessment of knowledge about UFTM's Innovation Policy; perception about the attributions of UFTM's Technological Innovation Center (TIC); Research, Development and Innovation (RD&I) activity carried out in the last 2 years; relevance of university researchers' knowledge to help the company to develop new products/services or to improve those already provided by it; interest in conducting activities in partnership with the university within the undergraduate courses' scope; factors hindering and favoring partnerships between university and companies; advantages of setting partnerships between university and company; company's interest in pursuing partnerships with the University (RD&I activities).

With respect to the UFTM research questionnaire, the structured interview was based on the following script: age (in years); time working at UFTM (in years); sex (female / male / I prefer not to inform); knowledge level assessment based on scientific development, research, scientific and technological training and innovation resulting from the Legal Framework for Science, Technology and Innovation; assessment of knowledge about UFTM's Innovation Policy; perception about the attributions of UFTM's Technological Innovation Center (TIC); Research, Development and Innovation (RD&I) activity carried out in the last 2 years; factors hindering and favoring partnerships between university and companies; advantages of setting partnerships between university and company; researchers' interest in setting partnerships with companies.

3 RESULTS AND DISCUSSION

Firstly, we sought to assess knowledge about incentives for research and innovation activities arising from the Legal Framework for Science, Technology and Innovation (MLCTI). Results have evidenced that the interviewed company representatives and researchers had poor (29.4% and 37.2%, respectively) to median (32.4% and 38.7%, respectively) knowledge about this topic, whereas a significant number of companies did not

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know anything about it (26.5%). This knowledge frailty can be explained if one takes into consideration that the mechanisms introduced by MLCTI remain fresh, notably due to the regulation provided by Decree n. 9.283 from 2018 (Brasil, 2018).

Miranda and Verde (2018) conducted the economic analysis of Brazilian results in the Global Innovation Efficiency Index and observed a shift between theoretical legal advancement and country's practical worsening. According to them, the level of knowledge about legislation presented by agents of the National Innovation System was one of the factors contributing to this phenomenon, with emphasis on companies that remain unaware of instruments available to develop activities in partnership with the public sector.

If one takes into consideration this context, the level of knowledge about UFTM's Innovation Policy is even lower, since half of the companies' respondents were unaware of the university's resolution. With respect to researchers, 38.7% presented poor knowledge about this topic, whereas 33.7% had median knowledge about it - 16.6% of respondents presented absolute lack of knowledge about it. According to Soares, Torkomian and Nagano (2020), the mere existence of university regulations does not positively affect new patent and technology transfer applications. The aforementioned authors associated positive effect with internal quality policy guided by clear, well-defined, available and actually applied regulations.

Despite the efforts made by UFTM's Technological Innovation Center (TIC) in revising the institution's Innovation Policy, by updating it and by better delimiting the introduced topics according to the MLCTI, results point towards the continuity of research focused on promoting institutional guidelines both to university and external communities (companies and society). The work based on strong and constant actions to promote the innovation culture at the university was identified among good practices put in place in the process to manage Technological Innovation Centers (TIC) that have proven to be successful in fulfilling their competencies (Cecílio, 2018).

With respect to the perception about UFTM TIC's responsibilities, it was possible noticing an even higher rate of participants who lacked such knowledge, based on results of the assessment (none) applied to most companies (55.9%) and on the number of researchers who declared to have poor knowledge about it, although they were part of the university organization.

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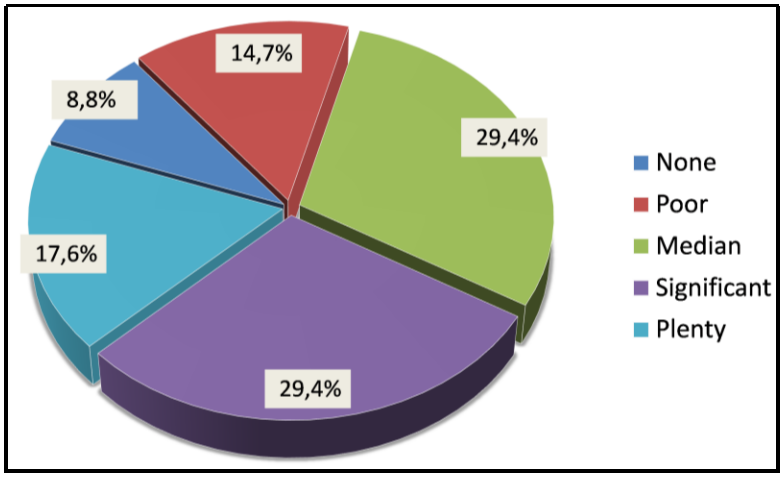
Accordingly, Souza Neto (2019) has evidenced that this lack of awareness and perception about TIC's functions may be associated with the poor promotion of services provided by it. This finding deserves attention, given TICs' strategic role of implementing institutional policies and intermediating relationships among companies, universities and governments that result in innovations with economic and social impact (Santos *et al.*, 2020).

When it comes to TIC's competencies, it is worth highlighting the treatment given by MLCTI to article 16, §1, item II, of the Innovation Law, which holds it accountable for assessing and classifying results arising from research activities and projects. It is worth emphasizing the significant activity of the investigated companies (85.3%) in developing RD&I projects, in the last 2 years, whereas researchers (60.8%) lacked significant engagement in carrying out projects with marketing potential.

It appears that researchers' participation in projects of this nature could be better perceived by encouraging research projects' registration in the system provided by the university (Integrated System - UFTMNet). Greater adherence to this procedure is of paramount importance to enable the visibility of different projects (potentially innovative and/or capable of being absorbed by the market) by the institution's research and innovation sectors, since it would enable them to be better used in collaboration with companies and, consequently, to bring better results to society.

Overall, results have shown the significant relevance of university researchers' knowledge to help developing new products/services or improving those already provided by companies, based on companies' assessment depicted in Figure 1.

Figure 1 Relevance of researchers' knowledge for the development of new products/services or for the improvement of those already provided by companies



Source: Elaborated by the authors, 2023.

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This finding is in compliance with similar study conducted by Rapini *et al*. (2009), who identified universities' double role in immature innovation systems. In addition to their typical functions, universities can both replace and complete research and development processes implemented in companies. Moreover, the current results corroborated these findings, since most companies reported to have interested in carrying out RD&I projects in partnership with the investigated university.

The current study assessed the factors hindering the initial approach to establish partnerships that, from the perspective of both companies and researchers, lie on poor knowledge about the potential of university-company interactions, as well as on lack of promotion and presentation of intellectual property produced at the university, as seen in the higher frequency of responses pointed out by these participants. This finding corroborated the study by Cunha and Fishmann (2003), who featured the poor knowledge about research potential in universities as the factor making it hard to approach companies to work in partnership with the university.

The analysis applied to categories associated with actions aimed at pursuing the implementation of partnerships enabled assessing the main difficulties faced by both companies and researchers in such a process, based on rates shown in Table 1.

Table 1 Rates recorded for companies and researchers based on actions taken by them to implement partnerships

Actions	Companies (%)	Researchers (%)
Yes, they sought and implemented the partnership	38.2	12.1
Yes, but they could not implement the partnership	8.8	18.1
They did not seek partnerships	52.9	69.8
Total	**100**	**100**

Source: Elaborated by the authors, 2023.

Based on categories recording the highest frequency of responses by companies and researchers, the main difficulties highlighted by participants comprised lack of knowledge about procedures and excessive bureaucracy, respectively.

Poor knowledge about procedures may be associated with lack of definition of appropriate organizational procedures and strategies. This observation meets the understanding by Tidd and Bessant (2015), according to whom, organizational support circumstances must be favorable to enable innovative processes to prosper.

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In addition, excessive bureaucracy stood out in researchers' assessment. This finding corroborates similar study conducted by Ribeiro and Alves (2019), who observed bureaucracy as the main barrier from professors' perspective. It also corroborates findings in other studies that acknowledged that despite MLCTI' legal advancements, bureaucracy and legal uncertainties are persistent obstacles to university-company interactions, and it showed that universities are still going through a learning process that requires time (Santos *et al.*, 2020; Miranda *et al.*, 2019).

It was possible noticing that the greater the proximity to universities, the more their bureaucracy is perceived, a fact observed in researchers' results and in companies' remarks. Bureaucracy was followed by lack of definition of property rights deriving from partnerships. According to Rapini, Chiarini and Bittencourt (2017), although bureaucracy perception prevailed among researchers, it was also significantly perceived by companies. This finding reinforces the need of implementing innovation management processes.

The herein conducted survey has evidenced that 7.5% of companies' responses and 13.2% of researchers' responses pointed out excessive bureaucracy in partnership formalization processes. Experiences observed in UFTM's managerial practice have shown that this perception, both by companies and researchers, arises from the long term of this process.

Furthermore, lack of definition of institutional procedures to be followed in order to conclude partnership agreements contributes to the interpretation of difficulties that are also perceived as excessive bureaucracy. This fact was overall observed in other cases associated with partnerships set at UFTM, which were herein investigated.

Deadline delay, as well as other obstacles seen by companies as factors accountable for intensifying bureaucratic obstacles, were evident in another herein analyzed partnership case, which was not associated with the partnership agreement for RD&I, but with a private sector company. In this case, a multinational company proposed donating inputs to the university, but it faced unexpected difficulties in achieving this partnership.

Among the aforementioned difficulties, there was one of legal nature, i.e., the selection of the competent district court, as well as its operationalization, since it involved a large amount of chemical materials susceptible to storage control. In both cases, the University was not prepared to deal with the challenges faced by it, and it led to the company's lack of interest in going on with the partnership under the initially agreed terms.

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With respect to the RD&I partnership agreement instrument, companies are not prepared to carry out the process-related procedures. This factor leads to delay in approving agreement instruments, either due to hesitation in taking on the responsibility for predicting financial values to the work plan or to expectations' misalignment between companies and the university, a fact that can even lead to communication issues.

On the other hand, researchers' perception about bureaucracy mainly results from the long time it takes to carry out procedures as required by legislation. Thus, it is necessary taking into consideration that professors' activity overload leads to lack of time to dedicate themselves, for example, to complete the work plan, in an appropriate manner, in order to meet its requirements, such as well-defined goals and indicators.

With respect to legal support, there is also the requirement to carry out selection processes focused on granting scholarships to students involved in research projects, in compliance with recommendations by the Federal Attorney's Office, which works along with UFTM. It is worth emphasizing that although the relevant legislation does not explicitly mention this obligation, the University is the partner accountable for internally implementing partnership agreements.

Thus, the need of establishing formal company-university relationships, in a duly substantiated manner and with detailed metrics, generates researchers' perception of bureaucratic procedures. Therefore, based on experiences reported by participants, it was possible seeing that a process defined based on procedural standards that were previously established and approved between sectors can help minimizing understanding disagreements between partners and units involved in the partnership, as well as making the process much faster and effective.

It is essential highlighting the significant number of companies that expressed no interest in developing RD&I projects with the university (44.1%), whose main justification for such a lack of interest lied on differences in time framing (18.2% of respondents). According to Dagnino and Gomes (2003), universities operate in the long term due to their mission of bringing technical and scientific knowledge to society, whereas companies aim at finding solutions in the short term, as mentioned by Ribeiro and Alves (2019). The report by one of the respondents, who was experienced in establishing partnerships, portrayed the barriers identified in the current study, since it mentioned bureaucracy and difficulty in establishing an agenda with well-defined objectives, targets and deadlines.

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According to Rapini, Chiarini and Bittencourt (2017), organizational issues (bureaucracy) are one of the obstacles indicating lack of qualified personnel with specific skills to communicate with both parties, since it is a significant factor in university-company interactions.

It is noteworthy that dialogue between those involved in partnership processes is not efficient in this context. In other words, difficulties were observed in several circumstances, such as the fact that the company had no idea that the researcher/professor was extremely busy, difficulty in agreeing about deadlines and those accountable for due diligence, as well as informal negotiations lacking formalization by email, among others. These difficulties could be overcome if there was better communication between researchers and companies or better conversation to stipulate actions and to make decisions official.

With respect to the main factors encouraging partnerships, the context previously presented in the current study contributed to companies' understanding that the disclosure of incentives and benefits generated through partnership implementation was the main factor (among those listed in the questionnaire) encouraging their interaction with the university, based on 27% of analyzed responses.

This perception fits the AMIEM model (Amaral Model for the Management of Innovation Environments), which is a tool comprising eleven factors used to measure maturity level in triple helix-type relationships and to recommend actions to improve effectiveness in innovation environments. Among the aforementioned factors, the model describes advertising/promotion/propaganda as "useful to attract companies, to get financial and political support, and to maintain high satisfaction levels among entrepreneurs" (Amaral; Faria; Schocair, 2020).

Institutional procedures' debureaucratization stood out among variables classified as stimulus factors, based on 23.6% of researchers' responses. The simplification of procedures set to manage science, technology and innovation projects was encouraged by Law n. 13.243/2016, through the introduction of item XII in Innovation Law n. 10.973/2004 (Brasil, 2016).

Accordingly, it is possible correlating difficulties highlighted in the current study to the reduced number of research, development and innovation partnership agreements signed at Federal University of Triângulo Mineiro. Based on the scenario depicted in the herein

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conducted survey, 7 partnerships are in progress (active); 1 is in preparation (negotiation); 3 were closed (completed); and 3 were not implemented / continued, in the last five years.

Thus, results in the current study reflect the need of setting new managerial and organizational procedures to help reducing bureaucracy in partnership processes at the university, as well as of better promoting UFTM's potential to meet companies' demands, to enable transferring both the technology and innovation developed in the investigated teaching and research institution to society.

Therefore, the current study proposes improvements capable of contributing to both expand and intensify university's relationship with companies, mainly improvements in the RD&I Partnership Agreement conclusion process, to help improving partnerships in the science, technology and innovation field between the private sector and Federal University of Triângulo Mineiro.

3.1 PROPOSALS TO IMPROVE PARTNERSHIPS BETWEEN UFTM AND COMPANIES

In order to improve the process adopted at UFTM to achieve Partnership Agreements to develop joint Research, Development and Innovation (RD&I) activities, the current study suggests implementing a specific Standard Operational Routine (SOR) for this legal instrument, with emphasis on a flowchart developed in Bizagi Modeler software, based on elements of the international Business Process Modeling Notation (BPMN) standard.

In order to do so, the draft of the herein proposed SOR was prepared in compliance with PROPLAN Ordinance n. 34/2021 and with guidelines on the institution's operational routines (UFTM, 2021). It contemplates requirements of Article 35, §1 of Decree n. 9.283 /2018, as well as follows definitions of intellectual property and participation in results deriving from the exploitation of products created through the partnership, in compliance with Article 37 of the aforementioned decree (Brasil, 2018).

If one takes into consideration that the currently adopted routine is guided by the experience of servers who work at the institution's TIC, it is "essential carrying out diagnostics and organizational analyses aimed at standardizing and regulating workflows to enable training other collaborators" (Nascimento; Lima; Rojo, 2017).

SOR institutionalization at UFTM can help improving the investigated process in a broader way that goes beyond its working method, since it enables both the understanding and

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identification of step-by-step actions to be carried out by all participants and units involved in the partnership process.

This document presents the partnership-process mapping and the adopted procedure's review, which focused on ruling out the herein diagnosed difficulties and on making the necessary adjustments to enable higher effectiveness and efficiency in the conclusion of RD&I Partnership Agreements between the investigated university and the private sector.

It is worth highlighting the procedure after improvements' implementation, whose details were split into 4 stages, namely: a) Partnership agreement negotiation; b) Process instruction and substantiation at SEI; c) Analysis and opinion (Diconv – by the Support Foundation, whenever it is involved in the process); and d) Federal Attorney's Office.

After complying with legal opinion recommendations and subsequent publication in DOU, it is recommended opening a sub-process to monitor the implementation of the project, as well as to formalize the technology ownership and the transfer of intellectual property resulting from the established partnership.

Furthermore, process mapping enables measuring the risks involved in the process to adopt measures focused on minimizing likely obstacles, such as withdrawal from the partnership or non-implementation of the project.

3.1.2 Work proposal to promote likely partnerships

With respect to the proposal regarding lack of disclosure, the "University/Company Partnership Guideline: portfolio of patents deposited at TIC/UFTM – 2015-2017" (Bittencourt, 2017) should be updated to be used as presentation tool towards companies. This disclosure should be carried out via email addressed to the companies, according to the contact method preferably indicated by results observed through the applied questionnaire.

However, the practice experienced by the TIC team has evidenced that the Networking mentioned by 19.6% of company representatives still leads to the best results when it comes to arousing the private sector's interest in developing activities in partnership with the university. Therefore, it is necessary further encouraging both TIC and researchers to use networking as a way of setting the first contact with company representatives.

Accordingly, encouraging participation in events, fairs and meetings with professionals from the private sector can help expanding individuals' awareness about the

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likelihood of setting university-company relationships, besides engaging researchers in the development of different technologies involving private sector companies.

Furthermore, it is possible envisioning other possibilities to encourage university-company interactions, since most companies see opportunities for partnerships in activities carried out within the scope of undergraduate courses (lectures, visits, among others), which could contribute to training students for practical knowledge application purposes, as emphasized by Varrichio and Rauen (2020).

According to Amaral, Faria and Schocair (2020), successful entrepreneurship configurations are linked to broad promotion/advertising through courses, seminars, congresses and visits, among others.

4 CONCLUSION

The main difficulties in establishing partnerships between the private sector and UFTM lies on lack of knowledge about the process-associated procedures (based on companies' perception) and on excessive bureaucracy (from researchers' perspective). With respect to the initial approach, the main difficulties reported by both the investigated researchers and companies converge to poor knowledge about the potential of university-company interactions and to lack of promotion and presentation of the intellectual property produced at the university.

In addition, most researchers and company representatives presented low level of knowledge about the legislation concerning MLCTI, as well as about the UFTM Innovation Policy and TIC's responsibilities. It is clear that the context of the herein observed results has contributed to participants' perception about the factors encouraging partnerships, since the promotion of both incentives and benefits deriving from partnerships' implementation, as well as from bureaucracy reduction in institutional procedures, were highlighted by companies and researchers, respectively, as the main incentives for partnerships.

Given this scenario, improvements were herein proposed to encourage university-company interactions at the institution. In order to do so, actions aimed at publicizing partnership incentives for private companies operating in the production sector, as well as at debureaucratizing procedures to contribute to their standardization and to better understand the partnership process, were herein recommended.

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Therefore, by mapping processes focused on concluding partnership agreements, the current research proposed a working method based on improvements' implementation to make this procedure easier, which was herein defined as Standard Operational Routine and flowchart.

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