

Entrepreneurial institution and regional development: analysis of the projects of the Federal Institute of Piauí.

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Abstract

Higher Education Institutions are strategic actors in the economic, social, environmental and cultural development of territories. This article aimed to identify the projects developed by the Federal Institute of Piauí Campus São João do Piauí, analyzing their relationship with the social and economic development of the Development Territory of Serra da Capivara. Data collection was carried out in the Unified Public Administration System. Projects in the research and extension modalities approved in public notices with results available in the 2019-2020 period were selected. Two search protocols were used, one for the research modality and the other for the extension modality. There was a greater concentration of projects approved by the São João do Piauí Campus in the 'Environment Dimension' (66.6%). The other projects were categorized into the 'Sociocultural' (22.2%) and 'Economic' (11.1%) dimensions. This points to a profile of human capital performance on the Campus for issues related to the Territory's sustainable, social and economic development.

Keywords: Territorial Development; Serra da Capivara Territory; Entrepreneurial University; Search; Extension;

1. Introduction

Studies in the area of entrepreneurship have grown significantly in recent years as a result of its implications for regional development. According to Hisrich, Peters, and Shepherd (2014), entrepreneurship is an essential factor in the creation and growth of businesses, as well as in the prosperity of nations and regions. In this sense, entrepreneurship can positively influence the national productive capacity and job creation (IPEA, 2009). However, it is highlighted that the entrepreneurial activity requires action oriented towards the recognition, evaluation and exploration of opportunities. Thus, public and private institutions, such as Higher Education Institutions (HEI), began to develop actions and projects in teaching, research and extension with the objective to support and promote regional development.

According to Ruiz and Martens (2019), numerous factors influence the curricular and administrative structure, financial and budget management, the quality of research and the process of knowledge diffusion

in Brazilian HEIs. These public and private institutions have the social function of generating new knowledge and improving existing practice through educational processes (Oliveira, Melo, & Muylder, 2016) and the development of teaching, research and extension projects.

In this sense, in addition to the search for social development, the primary mission of educational institutions, they act as strategic actors in contributing to territorial economic development, especially in the region where the institution operates, identifying and analyzing opportunities for action. This orientation of actions aimed at economic development can characterize the educational institution as an entrepreneur.

For Klein, Pereira, and Colla (2019), the practices of universities classified as entrepreneurial go beyond traditional teaching. These institutions, through their human capital, develop entrepreneurial activities and identify strategies that can contribute to social and economic development through the generation and capitalization of knowledge.

Based on this panorama, the Federal Institute of Education, Science and Technology of Piauí (IFPI), Campus São João do Piauí can represent a significant agent in the process of economic and social development of the Serra da Capivara Development Territory. This can occur through the promotion of entrepreneurial education and the planning and execution of research and extension projects aligned with the region's specificities.

Therefore, considering the importance of HEIs in socioeconomic development processes, the objective was to identify the projects (research and extension) developed by the IFPI Campus São João do Piauí, analyzing their relationship with the social and economic development of the Serra da Capivara Development Territory.

2. Theoretical Reference

The State of Piauí is composed of 12 Sustainable Development Territories (TDS), legally constituted and socially organized. These territories constitute the main units of government planning and action. They are made up of a group of municipalities, with historical identity and natural heritage, their own organization and participatory planning (Piauí, 2017).

Among these regional scenarios, there is the Serra da Capivara Development Territory (TDSC), located in the semi-arid macro-region of Piauí. This Territory is composed of 18 counties, which present socioeconomic aspects in common, such as family farming, fruit growing, beekeeping, archeological tourism and handicraft (CEPRO, 2018).

Regarding its edaphoclimatic aspects, this territory is characterized by a warm semi-arid climate, predominantly caatinga vegetation and water resources from rivers and dams (PTDRS, 2006). Regarding its potential, agriculture and livestock, tourism, renewable energies, trade and industry, and beekeeping stand out (IBGE, 2017).

Therefore, considering the characteristics of each territory, it is essential to understand how their development takes place and which variables are involved in this process. In this sense, it is understood that a territorial development plan needs to consider different dimensions. Therefore, Buarque (2008) presented dimensions that allow a better analysis and understanding of these variables.

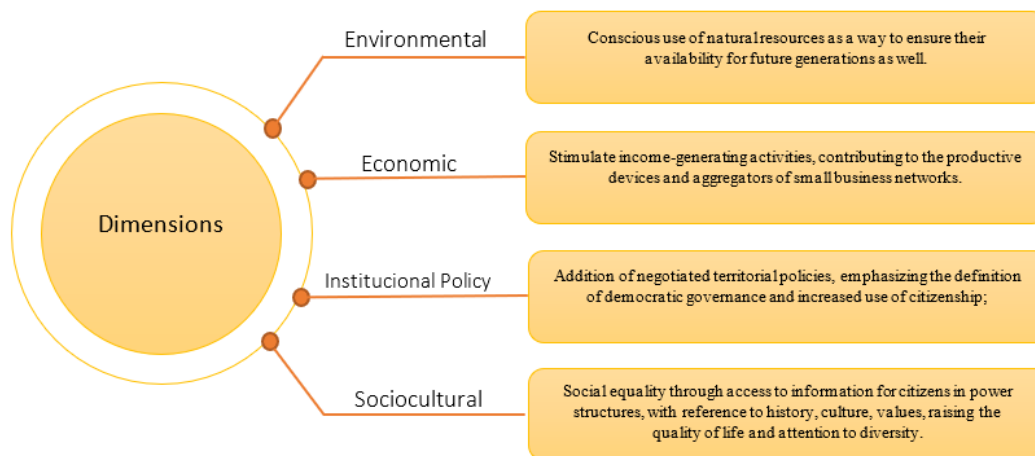


Figure 1. Dimension of Territorial Development

Source: Adapted from Buarque, 2008.

In this context, it is noted that HEIs, as well as other public and private institutions, are strategic actors in the process of economic, social, environmental and cultural development of territories. Thus, an HEI with entrepreneurial characteristics can act in the planning and execution of projects with objectives aligned with the development of innovative solutions for resolution social problems (Barbosa & Otte, 2019) and exploring opportunities and strengthening Local Productive Arrangements.

However, it is necessary to have an ambience that favors the engagement between HEIs, government agencies, private companies and communities for the development of actions focused on the generation of innovative solutions. In this sense, some methodologies were created, such as the Innovation Helix Model. The original conception of the Helix Model presents the University, Government and Industry as protagonists of the regional innovation process. According to the methodology, the interaction between these three agents favors the development of successful innovation strategies (Etzkowitz & Zhou, 2017). In this structure, the actors perform different functions: industry is seen as the technological base; government as the stable source of contractual relationships; and the university as a source of new knowledge and technologies (Etzkowitz, 2009).

However, given the complexity of the innovation generation process, the Helix Model was updated to respond to the new demands that were not met by the Industry-Government-University triad. Thus, two new perspectives were added to the model, creating two new helices: organized civil society and the natural environment.

The inclusion of the fourth helix in the model demonstrates the need to recognize the role of civil society in the regional innovation process (Mineiro & Castro, 2020). The fifth helix, on the other hand, highlights society's natural environments for the production of knowledge and innovation and for sustainable development (Mineiro et al., 2018; Grundel & Dahlstrom, 2016).

Considering the triple helix perspective, the role and responsibility of the university in the development of society are notorious. It represents a natural environment for the production and dissemination of

knowledge, generating countless benefits such as critical research, education and conservation of cultural heritage (Etzkowitz & Zhou, 2017).

Furthermore, according to teaching, research and extension policies and strategies, universities can be perceived as a source of entrepreneurship, technology and information. In this context, the Federal Institutes of Education, Science and Technology, with their multicampi structure, have a clear definition of their territory of action. Thus, seeking alignment with regional potential, these institutions are committed to intervening in the regions, identifying problems and creating technical and technological solutions for sustainable development with social inclusion (Pacheco, 2011).

In this sense, one of the purposes of the Federal Institute of Education, Science and Technology of Piauí is to carry out and encourage applied research, cultural production, entrepreneurship, cooperativism and scientific and technological development. In addition, among its objectives, there is an incentive and support for educational processes that promote the generation of work and income and citizen autonomy from the perspective of local and regional socioeconomic development (Brasil, 2008).

3. Material and methods

This is a survey of a basic nature. As for the qualitative and quantitative approach and descriptive regarding the objective. In order to identify the research and extension projects of the São João do Piauí Campus of the IFPI, a search was carried out in the Public Administration's Unified System in September 2021.

For this purpose, research and extension projects approved in public notices with results available in the Public Administration System, in the period 2019-2020, were selected, using two search protocols for data collection.

The first data collection, with the objective of identifying the research projects, took place in accordance with protocol 1: (a) identification of research notices with available results; (b) application of the 'filter by year' filter, indicating the year 2019; and then the filter 'filter by year', indicating the year 2020; (c) selection of projects approved by the IFPI Campus São João do Piauí in each of the public notices.

The second data collection, with the objective of identifying the extension projects, took place in accordance with protocol 2: (a) identification of extension notices with available results; (b) application of the 'filter by year' filter, indicating the year 2019; and then the filter 'filter by year', indicating the year 2020; (c) selection of projects approved by the IFPI Campus São João do Piauí in each of the public notices.

After applying the search protocols in the system, the data were organized in electronic spreadsheets. In worksheet 1, the data corresponding to the 'research' modality were inserted, considering the following aspects: i) published research notices; ii) approved projects; iii) projects approved by the São João do Piauí Campus; iv) title of the project approved by the São João do Piauí Campus, basic information for the categorization of projects in terms of territorial development dimensions presented by Buarque (2008).

In worksheet 2, the data corresponding to the 'extension' modality were inserted, considering the following aspects: i) published extension notices; ii) approved projects; iii) projects approved by the São João do Piauí Campus; iv) title of the project approved by the São João do Piauí Campus, basic information for the categorization of projects in terms of territorial development dimensions presented by Buarque (2008).

Finally, the identified projects (research and extension) were categorized in the dimensions of territorial development presented by Buarque (2008): environmental, economic, political-institutional and sociocultural. Therefore, the titles of all projects carried out by the Human Capital of the São João do Piauí Campus were analyzed. The results were presented in graphic form and discussed according to scientific literature and institutional documents.

4. Results

Considering the time frame (2019-2020) and the search protocol applied, a total of 20 research notices with available results were identified in the unified system of public administration, covering 185 approved projects.

In 2019, 11 public notices were identified with available results and a total of 77 projects approved. Of the total volume of research projects approved in 2019 (77), 4 were approved by the human capital of the IFPI - São João do Piauí Campus (Figure 1).

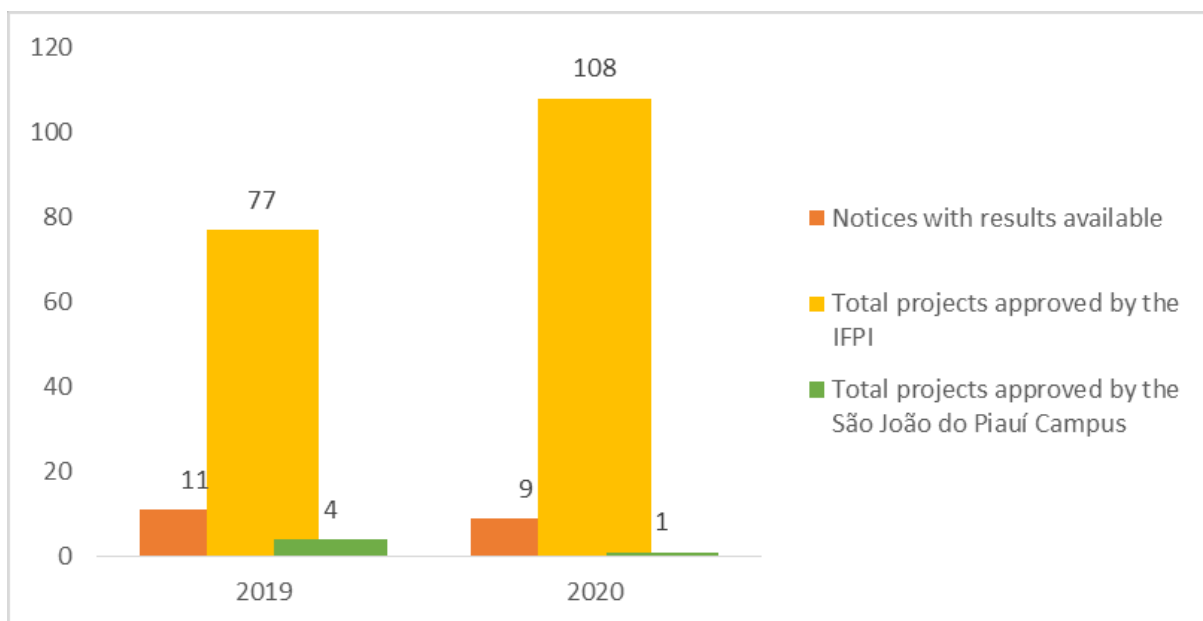


Figure 1 - Quantitative of research notices with available results and projects approved in 2019 and 2020

Source: Survey data (2021)

In 2020, 9 research notices were identified with available results. In these notices, 108 projects were approved. Of this quantity of research projects approved in 2020 (108), only 1 was approved by the IFPI - São João do Piauí Campus (Figure 1).

Considering the period researched and the search protocol applied, 02 extension notices with available results and 137 approved projects were identified in the Public Administration's Unified System.

In 2019, 1 public notice was identified with available results and a total of 81 projects were approved. Of the total volume of extension projects approved in 2019 (81), 2 were approved by the human capital of the IFPI - São João do Piauí Campus (Figure 2).

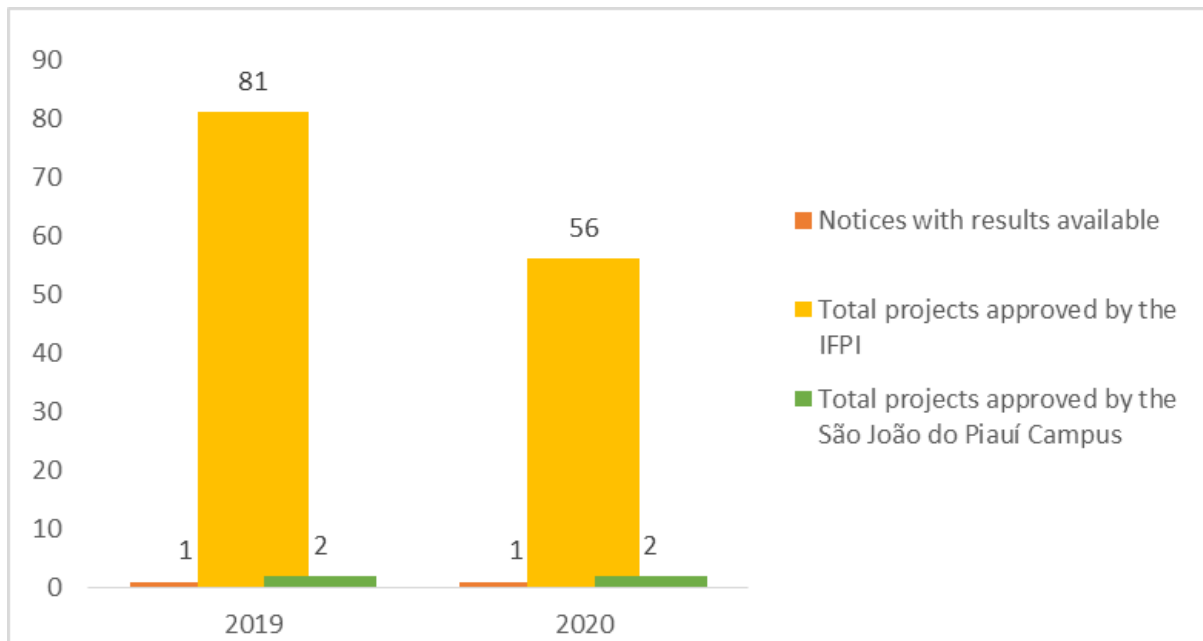


Figure 2 - Quantitative of extension notices with available results and projects approved in 2019 and 2020

Source: Survey data (2021)

In 2020, 1 extension notice was identified with available results. In this notice, 56 projects were approved. Of this quantity of extension projects approved in 2020 (56), only 1 was approved by the IFPI - São João do Piauí Campus (Figure 2).

5. Results Discussions

Considering the results presented, it was observed that in the period 2019-2020, 322 projects were approved, 185 in the Research modality and 137 in the Extension modality. Of this total number of projects, 9 (5 Research projects and 4 Extension projects) were approved by the human capital of the São João do Piauí Campus. Thus, it is possible to highlight that, of the overall total of projects approved by the IFPI, the São João do Piauí Campus approved the equivalent of 2.8%.

Of the volume of research projects approved by the IFPI in the defined time frame, the São João do Piauí Campus approved the equivalent of 2.7% of the total projects identified in the notices. It is also possible to observe that in the year 2019 there was a greater number of public notices published (4), compared to the year 2020 (1). However, in relation to the number of projects approved by the IFPI, it is noted that there was a greater volume in 2020 (Figure 1).

Regarding the extension modality, of the total volume of projects approved by the IFPI in the established time frame, the São João do Piauí Campus approved the equivalent of 2.9% of the total projects identified in the notices (2 in 2019 and 2 in 2020). In 2019, there was a greater number of projects approved (81) compared to 2020 (56) (Figure 2).

Considering the role of the IFPI in promoting actions that contribute to the socioeconomic development of the communities in which the campuses are located, such as research and extension projects, it is necessary

to analyze in what aspects these projects contribute to the development of the Territory of Development of Serra da Capivara.

In this sense, the alignment of the projects approved by the São João do Piauí Campus with the dimensions of territorial development presented by Buarque (2008) was analyzed. According to the author, territorial development must consider the integration of economic, sociocultural, political-institutional and environmental dimensions, with a focus on agents, social actors, markets and public policies that take place in this space.

Among the number of projects approved by the São João do Piauí Campus (9) in the research and extension modalities, 6 are categorized in the environment dimension (66.6%), 2 in the sociocultural dimension (22.2%) and 1 in the economic dimension (11.1%).

The categorization of 6 projects in the 'Environment Dimension' demonstrates the performance of the Campus in the development of actions aimed at environmental aspects, highlighting the need to consider the natural environment of society, a focus of the five-fold innovation helix for territorial development (Silva, 2021). Thus, the projects follow in accordance with the purposes of the IFPI, which establish that professional and technological education must promote the production, development and transfer of social technologies, notably aimed at preserving the environment.

The project categorized in the 'Economic Dimension', refers to the vision of territorial development linked to the positive increase in economic and social indicators. In this sense, the actions of HEIs in this dimension need to be structured according to territorial specificities. Following this thought, several currents emerged that present development as a way to expand and diversify productive activities, which generates work, employment, income and provides economic and social development (Costa, Alperstedt & Andion, 2018) in the context of a territory.

Otherwise, the categorization of the 2 projects in the sociocultural dimension demonstrates the Campus' interest in strengthening the social and cultural aspects of communities, proposing solutions that contribute to the promotion of social equality. Projects of this dimension contribute to territorial development by enabling interaction between communities through cultural policies, strengthening the personal and collective identity of individuals and creating a greater sense of belonging to the environment in which they live (IPEA, 2018).

The performance of the IFPI is in line with the last two dimensions presented, as its activities are linked to education for the strengthening of productive arrangements identified from the mapping of the potential for socioeconomic and cultural development within the scope of the activities of the Federal Institute (Brasil, 2008). Therefore, it can be said that the development of the territory is related to social, economic and cultural aspects, which are in constant evolution and which contribute to the construction of the geographic space (Costa, Alperstedt & Andion, 2018).

5. Conclusion

Public and private institutions, like HEIs, are strategic actors in the promotion of territorial development, whether through the dissemination of knowledge or the execution of actions focused on the specificities of the territory.

The results obtained demonstrate that the human capital of the IFPI - São João do Piauí Campus has been participating in research and extension notices. However, the percentage of projects approved by the Campus in the notices (2.8%) is relatively low considering the amount of projects approved under the IFPI in the period surveyed.

The categorization of projects identified in the dimensions of territorial development presented in the scientific literature suggests that they are directly related to the development of the territory of Serra da Capivara. The highest concentration of projects approved by the Campus is found in the 'Environment Dimension' (66.6%), followed by the 'Sociocultural' (22.2%) and 'Economic' dimensions (11.1%). This points to an action profile of the Campus' human capital for issues related to the territory's sustainable, social and economic development.

As a suggestion for future research, it is recommended to expand the time frame, as well as analyze the aspects that can interfere, positively or negatively, in the volume of public notices published per year and in the number of projects approved by the institution.

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7. References

- Barbosa, R. P., and Otte, H. (2019). *Inovação e empreendedorismo*. Editora Seses.
- Brasil. (2006). *Plano Territorial de Desenvolvimento Rural Sustentável - PTDRS. Território de Desenvolvimento Serra da Capivara Piauí*. Retrieved 20 jun. 2021, from http://sit.mda.gov.br/download/ptdrs/ptdrs_territorio077.pdf
- Brasil. (2008). *Lei nº 11.892 de 29 de setembro de 2008*. Institui a Rede Federal de Educação Profissional, Científica e Tecnológica, cria os Institutos Federais de Educação. Retrieved 15 ago. 2021, from http://www.planalto.gov.br/ccivil_03/_ato2007-2010/2008/lei/11892.htm.
- Buarque, S. C. (2008). *Construindo o desenvolvimento local sustentável: metodologia de planejamento*. Editora Garamond.
- Carayannis, E. G., Campbell, D. F. J., and Rehman, S.S. (2016). Mode 3 knowledge production: systems and systems theory, clusters and networks. *Journal of Innovation and Entrepreneurship*, 5(17), 1-24.
- Centro de Pesquisas Econômicas e Sociais do Piauí. (2018). *O Índice de Vulnerabilidade Social no Piauí por Territórios de Desenvolvimento*. Teresina, Fundação CEPRO. Retrieved 21 out. 2021, from http://www.cepro.pi.gov.br/download/201802/CEPRO08_365efb6de8.pdf
- Costa, T., Alperstedt, G. D., and Andion, C. (2018). Dimensões da abordagem territorial do desenvolvimento: uma proposta conceitual. *Revista Brasileira de Gestão e Desenvolvimento Regional*, 15(2), 179-193.
- Etzkowitz, H. (2009). *Hélice Tríplice Universidade-Indústria-Governo: Inovação em Movimento*. Editora EDIPUCRS.
- Etzkowitz, H., and Zhou, C. (2017). Hélice Tríplice: inovação e empreendedorismo universidade-indústria-governo. *Estudos Avançados*, 31(90), 23-25.
- Grundel, I., and Dahlström, M. (2016). A quadruple and quintuple helix approach to regional innovation systems in the transformation to a forestry-based bioeconomy. *Journal of the Knowledge Economy*, 7(4), 963-983.
- Hisrich, R. D., Peters, M. P., and Shephers, D. A. (2014). *Empreendedorismo*, AMGH Editora Ltda.

- Instituto Brasileiro de Geografia e Estatística. (2017). *Censo Agropecuário*. Retrieved 17 jun., 2021, from <https://www.ibge.gov.br/estatisticas/economicas/agricultura-e-pecuaria/21814-2017-censo-agropecuario.html>
- IPEA - Instituto de Pesquisa Econômica Aplicada. (2009). *Sociedade e Economia: estratégias de crescimento e desenvolvimento*. Retrieved 15 jun., 2021, from https://www.ipea.gov.br/portal/images/stories/PDFs/livros/livro_sociedadeeeconomia.pdf
- IPEA - Instituto de Pesquisa Econômica Aplicada. (2018). *Direito à cidade, cidades para todos e estrutura sociocultural urbana*. Retrieved 20 ago., 2021, from <http://repositorio.ipea.gov.br/handle/11058/8622>
- Klein, B. S., Pereira, F. C. M., and Colla, P. E. B. (2019). Dinâmica da Universidade Empreendedora: Conceituações e a Evolução de Modelos Teóricos. *XLIII Encontro da ANPAD - EnANPAD 2019*, São Paulo, SP, BR, 43.
- Mineiro, A. A. C., and Castro C. C. (2020). A Hélice Quádrupla e sua relação com a visão de futuro dos Parques Científicos e Tecnológicos consolidados no Brasil. *Revista de Administração, Sociedade e Inovação*, 6(2), 71-89.
- Mineiro, A. A. C., Souza, D. L., Vieira, K. C., Castro, C. C., and Brito M. J. (2018). Da Hélice Tríplice à Quíntupla: uma revisão sistemática. *E&G Economia e Gestão, Belo Horizonte*, 18(51), 77-93.
- N. Silva, O. (2021). A hélice quíntupla como motor propulsor da inovação e desenvolvimento de Anápolis, Goiás, Brasil. *Revista Processos Químicos*, 15(29).
- Oliveira, A. G. O., Melo, M. C. O. L., and Muylder, C. F. (2016). Educação Empreendedora: O Desenvolvimento do Empreendedorismo e Inovação Social em Instituições de Ensino Superior. *Administração em Diálogo*. 18(1), 29-56.
- Pacheco, E. (2011). *Institutos Federais: uma revolução na educação profissional e tecnológica*. Editora Moderna.
- Piauí. (2017). *Lei n° 6.697 de 03 de abril de 2017*. Altera a Lei Complementar n° 87 de 22 de agosto de 2007, que estabelece o Planejamento Participativo Territorial para o Desenvolvimento Sustentável do Estado do Piauí e dá outras providências. Retrieved 21 out., 2021, from www.seplan.pi.gov.br/download/201905/SEP03_8d4698d08e.pdf
- Ruiz, S. M. A., and Martens, C. D. P. (2019). Universidade Empreendedora: proposição de modelo teórico. *Desenvolvimento Em Questão*, 17(48), 121–138.