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## ***THE ROLE OF UNIVERSITIES IN FORMING ENTREPRENEURIAL ECOSYSTEMS IN CHALLENGING SOCIOECONOMIC CONTEXTS<sup>1</sup>***

### ***O PAPEL DAS UNIVERSIDADES NA FORMAÇÃO DOS ECOSSISTEMAS DE EMPREENDEDORISMO EM CONTEXTOS SOCIOECONÔMICOS DESAFIADORES***

*Waldir Pereira Neto<sup>2</sup>*

*Antonio Genilton Sant'Anna<sup>3</sup>*

*Cinthya Rocha Tameirão<sup>4</sup>*

#### **ABSTRACT**

The aim of this article is to identify practical actions that universities can take to boost the formation of entrepreneurial ecosystems in less economically developed regions. The guiding question was: how can universities act to form an entrepreneurship ecosystem in challenging socio-economic contexts? A literature review was carried out by searching for articles in the Scopus, Web of Science and CAPES Journals Portal databases. The Rayyan tool was used to select the texts relevant to the research. After applying the search filters and exclusion criteria, five articles were selected for the review. The results indicate the importance of context in the formation of entrepreneurial ecosystems, which precludes simply exporting successful models from other locations. The conclusions highlight the relevance of the 'Entrepreneurial University' model, which must be structured internally to foster entrepreneurship and be open to interaction with external actors. It is recommended that future research focuses on the role of universities in the formation of entrepreneurial ecosystems in regional contexts with low social indicators, given that there is a lack of studies in this regard.

**Keywords:** university, entrepreneurship, entrepreneurial ecosystem, socioeconomic development.

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<sup>2</sup> Universidade Federal dos Vales Jequitinhonha e Mucuri. [wpneto90@gmail.com](mailto:wpneto90@gmail.com)

<sup>3</sup> Universidade Federal dos Vales Jequitinhonha e Mucuri. [agsantanna@ict.ufvjm.edu.br](mailto:agsantanna@ict.ufvjm.edu.br)

<sup>4</sup> Universidade Federal dos Vales Jequitinhonha e Mucuri. [cinthya.tameirao@ufvjm.edu.br](mailto:cinthya.tameirao@ufvjm.edu.br)



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## RESUMO

Este artigo tem como objetivo identificar ações práticas que as universidades podem adotar para impulsionar a formação de ecossistemas de empreendedorismo em regiões economicamente menos desenvolvidas. A questão norteadora estabelecida foi: como a universidade pode atuar na formação de um ecossistema de empreendedorismo em contextos socioeconômicos desafiadores? Foi delineada uma revisão bibliográfica a partir da busca por artigos nas bases de dados Scopus, Web of Science e Portal de Periódicos da CAPES. A ferramenta Rayyan foi utilizada para seleção dos textos pertinentes à pesquisa. Após a aplicação dos filtros de busca e critérios de exclusão, foram selecionados cinco artigos para a revisão. Os resultados indicaram a importância do contexto na formação dos ecossistemas de empreendedorismo, o que desaconselha a simples exportação de modelos de sucesso de outras localidades. As conclusões ressaltam a relevância do modelo de 'Universidade Empreendedora', a qual deve estar estruturada internamente para fomentar o empreendedorismo e ser aberta à interação com atores externos. Recomenda-se que pesquisas futuras se concentrem na atuação da universidade na formação de ecossistemas de empreendedorismo em contextos regionais com baixos indicadores sociais, dado que há uma lacuna de estudos nesse sentido.

**Palavras-chave:** universidade, empreendedorismo, ecossistema de empreendedorismo, desenvolvimento socioeconômico.



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## INTRODUCTION

In general, it is widely accepted that entrepreneurship is intrinsically linked to economic progress, even though it is not widely addressed in conventional economic models (Barros; Pereira, 2008). According to Dutu and Diaconu (2015), the term "entrepreneur" originates from the French word *entreprendre* and was initially associated with the activity of buying goods for resale. Over time, the concepts of entrepreneur and entrepreneurship have evolved and have been discussed in various ways in literature.

Entrepreneurship is no longer only understood as a form of leadership and has come to be recognized as a management approach aimed at creating organizational success through innovative developments. These innovations may involve changes in organizational structure, culture, or the products/services offered. Schumpeter (1949) described entrepreneurship as "the gale of creative destruction," a process in which products and even business models are replaced by new combinations of production resources, driving the economy and development (Dutu; Diaconu, 2015). As highlighted by Schumpeter (2014), entrepreneurs render certain industries obsolete while creating new ones. They actively seek change and view it as a source of new opportunities.

Previous works on entrepreneurship tended to ignore the role of context, aiming to create generalizable models of entrepreneurial activity. However, instead, context should be the specific focus of investigation. A context, such as location, should not be treated as a mere variable. It is essential to conduct a deeper analysis of how the structures and cultural, social, political, and economic processes associated with a particular place influence all aspects of entrepreneurship (Stam; Spigel, 2016).

In this sense, a new concept widely used to describe the structure of entrepreneurship is the entrepreneurial ecosystem. The concept of ecosystem comes from the science of biology. It is defined as a set of relationships between



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living and non-living organisms whose purpose is to maintain their natural states in balance (Ierapetritis, 2019). This ecosystem is made up of a variety of actors, including individuals, organizations, and institutions, who play a fundamental role in influencing successful entrepreneurial behavior (Dutu; Diaconu, 2015). According to Spigel (2017), entrepreneurial ecosystems are combinations of social, political, economic, and cultural elements within a given region. These ecosystems support the development and growth of innovative companies and encourage novice entrepreneurs and other actors to take the risks of starting, financing, and supporting high-risk ventures. An entrepreneurial ecosystem includes several entities as important factors, such as large companies, universities, financial institutions, and government organizations that support new and growing businesses. The entrepreneurial ecosystem approach differs from industrial district, cluster, and innovation system approaches by placing the entrepreneur, and not the company, at the center of the analysis. This approach begins with the entrepreneur rather than the company but also emphasizes the importance of the social and economic context that surrounds the entrepreneurial process (Stam; Spigel, 2016). This perspective highlights the importance of a dynamic and collaborative network in which diverse agents work together to strengthen and sustain entrepreneurship as an engine of change and economic progress.

Research on ecosystems is very recent and still under-theorized. There is a lack of comprehensive and systematic review of the existing literature on the constituents of innovation and entrepreneurial ecosystems (Yaghmaie and Vanhaverbeke, 2019). There is no specific definition that is widely accepted. Definitions vary according to different scales, research fields, and data. Most definitions emphasize the combination and interaction, mainly through networks, between institutions that produce common cultural values that support business activities (Ierapetritis, 2019).



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To show the overall picture of an ecosystem, making the system's significant entities and their interconnections visible is the starting point (Huhtamaki; Rubens, 2016). However, the approach does not specify the desired level of analysis. Geographically, this level can be a city, a region, or a country. In addition, other systems that are not rigidly limited in space, such as sectors or corporations, may be considered, as they provide opportunities for the establishment and development of companies (Stam; Spigel, 2016).

In the various possible ecosystem configurations, the need for an "orchestrator" is emphasized (Yaghmaie; Vanhaverbeke, 2019). This would be an agent or entity responsible for coordinating and articulating the various parts and actors involved in the ecosystem. Such a figure plays an essential role in creating connections, synergies, and collaborations among the different ecosystem components, such as universities, startups, companies, research institutions, investors, mentors, and government bodies. The orchestrator seeks to promote interaction, knowledge exchange, resource facilitation, and the development of an entrepreneurial culture, aiming to drive innovation, economic growth, and value creation within the ecosystem.

According to Ierapetritis (2019), universities are the linking institutions between all partners in an entrepreneurial ecosystem. Currently, the role of universities has changed considerably. They have shifted from an exclusive role of education and research activities to institutions capable of influencing a region's economic growth. This means universities have become key players in the entrepreneurial ecosystem (Mazzarol; Battisti; Clark, 2016). Concerns regarding the university's role as an agent of regional development aim to emphasize its fundamental importance in promoting innovation, entrepreneurship, community interaction, and environmental preservation (Silva et al., 2021).



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Universities are recognized as institutions and environments rich in knowledge, playing a fundamental role in the joint performance of education, advanced research, and knowledge networks. They foster the development of human capital, drive innovation, and encourage entrepreneurship, thus contributing to the advancement and progress of society. Their role as centers of academic excellence and sources of expertise creates an environment conducive to the acquisition of knowledge, empowering individuals and driving the creation of new ideas and solutions (Ierapetritis, 2019).

According to Feld (2012), to exert influence as business and innovation institutions, universities must engage with the student community, the business community, and other stakeholders, overcoming any existing bureaucratic constraints. Additionally, promoting an entrepreneurial culture among students and faculty is essential to foster an innovative spirit, creating a stimulating environment that increases the number of entrepreneurial projects. Universities also strengthen their role by establishing partnerships with companies and industries, through business incubators, technology, industrial and research parks, and university-industry partnerships. Encouraging the transfer of scientific and technological information also plays an important role in supporting university performance (Dutu; Diaconu, 2015).

According to Ierapetritis (2019), it is crucial for universities to understand the regional ecosystems in which they are inserted. Beyond interest in entrepreneurial ecosystems, it is necessary for members of the academic community to have a clear vision and understanding of the current situation of these ecosystems at the regional and local levels. This includes the stakeholders involved, such as entrepreneurs, their motives, opportunities, and challenges. Thus, a literature review was outlined to answer the following guiding question: “how can universities act to form an entrepreneurial ecosystem in challenging socioeconomic contexts?” The objective is to identify practical actions adopted



by universities that can contribute to the formation of entrepreneurial ecosystems in less economically advantaged regions.

## METHODOLOGICAL PROCEDURES

Initially, a search was conducted in the Scopus, Web of Science, and Capes Journals Portal databases. The following descriptors were used in the search: universit\* AND “entrepreneurial ecosystem\*”. As a search strategy, the filters applied were scientific articles, published between 2013 and 2023, in English, and open access. The search results are summarized in Table 1.

Table 1 - Search results by database

| Database              | First descriptor field | Second descriptor field      | Total articles |
|-----------------------|------------------------|------------------------------|----------------|
| Scopus                | Article title          | Title, abstract, or keywords | 46             |
| Web of Science        | Article title          | All fields                   | 41             |
| CAPEJ Journals Portal | Article title          | Any field                    | 81             |
| TOTAL                 |                        |                              | 168            |

Source: Prepared by the authors.

Research on the relationship between universities and entrepreneurial ecosystems has proven to be quite recent. Most of the scientific production found in the search is concentrated in the last five years. Of the total articles found, 93% were published between 2018 and 2023 (156 articles), and only 7% between 2013 and 2017 (12 articles).

The Rayyan tool was used to apply the exclusion criteria, namely: duplicate documents; systematic or integrative literature reviews; articles that did not answer the guiding question after analysis of the title, abstract, and keywords; and articles that did not answer the guiding question after a full reading of the text. Documents in languages other than English were also excluded, even if they appeared despite the selected language filter. Table 2 shows the number of articles excluded under each criterion.



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Table 2 - Number of articles by exclusion criterion

| Exclusion Criterion   | Number of articles excluded |
|---|-----------------------------|
| Duplicates  | 74                          |
| Systematic and integrative literature reviews   | 6                           |
| Does not answer the guiding question (after reading the title, abstract, and/or keywords) | 76                          |
| Does not answer the guiding question (after full text reading)                            | 5                           |
| Language other than English   | 2                           |
| Total articles excluded   | 163                         |

Source: Prepared by the authors.

## RESULTS AND DISCUSSION

After applying the exclusion criteria, five articles were selected for analysis. Those selected explicitly describe practical actions that can be adopted by the university as a social actor with the potential to drive the formation of an entrepreneurship ecosystem in contexts with limited resources. The selected articles are presented in Chart 1.



Chart 1 - Selected articles for analysis

| Year | Title  | Author(s)                         | Summary of contributions regarding the guiding question  |
|------|--|-----------------------------------|--|
| 2016 | Development of academic entrepreneurship in a non-mature context: the role of the university as a hub-organisation | Schaeffer, V.; Mireille, M.       | The university can contribute to building an entrepreneurship ecosystem by becoming a “hub-organisation” that encourages academic entrepreneurship throughout the entire process of creating new ventures; the university should adopt a selective startup creation model, considering the growth prospects of ventures, and by seeking partnerships with large companies, startups, highly qualified human resources at all startup stages, venture capital, top universities, broad governmental participation in the formation of science and technology, and an entrepreneurial culture.   |
| 2019 | Development of entrepreneurial ecosystem through university new companies  | Vekiy, A.; Borocki, J.; Fajsi, A. | The importance is emphasized of creating a supportive environment for university startups and spin-offs, which includes financial resources, mentoring, training, and networking; highlights as a strategy the transfer of technology from the university to industry and other organizations.   |
| 2019 | University business school as an entrepreneurial ecosystem hub   | Allahar, H.; Sookram, R.          | It highlights the importance of entrepreneurial education, which should be incorporated into university curricula to prepare students for launching innovative businesses; suggests the creation of university-led business incubators that can provide resources and support for entrepreneurs, as well as help them develop their business ideas; collaboration between universities, industry, government, and civil society is fundamental, as it can help create a favorable environment for new businesses and innovations; the creation of informal relationships that facilitate the collaboration of key stakeholders is important, so they can work together more effectively. |



Chart 1 - Selected articles for analysis

| Year | Title  | Author(s)                                   | Summary of contributions regarding the guiding question  |
|------|--|---|--|
| 2021 | The impact of global socio-economic changes on the regional role of universities                         | Pupp, Z.;<br>Filep, B.                      | The university should develop an entrepreneurial culture (geared towards the entrepreneurial university model), encouraging innovation, creativity, and the search for solutions to social and economic problems, as well as create science parks and business incubators to support the development of new businesses and the transfer of technology to the community; indicates the need to establish collaborative networks with other universities and research institutions to share knowledge and resources and promote innovation and entrepreneurship.   |
| 2021 | Universities as orchestrators of the development of regional innovation ecosystems in emerging economies | Thomas, E.;<br>Faccin, K.;<br>Asheim, B. T. | Universities can contribute to the formation of an entrepreneurial ecosystem by taking on leadership roles and orchestrating the establishment of a regional network of stakeholders. This involves going beyond their traditional missions of teaching, research, and industry collaboration for innovation, and working in partnership with government and other organizations to create an environment conducive to entrepreneurship and innovation. Universities can play an important role in building trust and social capital in emerging economies, where governments are often corrupt and institutions are weak. They can also provide resources and specialized knowledge to support the development of startups and innovative ventures. |

Source: Own authorship.

In general, the literature addresses entrepreneurship ecosystems in economically affluent regions, such as European countries or other major centers. Therefore, these models often have limited practical applicability in emerging economic regions. The consensus among the authors of the selected articles is that while it can be useful to learn from models developed elsewhere, the university should not simply copy these models but adapt them to local conditions.



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One of the strategies for the university's contribution to the formation of an entrepreneurial ecosystem is the adoption of orchestration practices. These practices consolidate the role of universities as local leaders, promoting new projects for the ecosystem. This can be done through the selection of the initial actors who will participate in the actions and the transfer of responsibility for collective actions to other members of the ecosystem. This delegation of responsibilities reflects the quadruple helix concept, which brings together the university with organized civil society, companies, and government, with the aim of supporting innovation and entrepreneurship ecosystems, enabling the development of these ecosystems through a combined top-down and bottom-up strategy (Allahar; Sookram, 2019; Thomas; Faccin; Asheim, 2021; Pupp; Filep, 2021).

The university's role as a "hub organization," that is, connecting different actors and resources, is fundamental to the formation of ecosystems in challenging contexts. In their study, Schaeffer and Matt (2016) show that the entrepreneurial ecosystem progressively matured under the influence of the university as a hub and with political support at the national level. The model presented in the study is conceived as a triple helix that encompasses university-industry-government interactions. In practice, the hub university generated trilateral networks and hybrid organizations such as incubators and a specific technology transfer office (Schaeffer; Matt, 2016; Allahar; Sookram, 2019). A technology transfer center can serve as a link between the scientific and industrial worlds, providing financial resources, technical, industrial, and legal skills, business knowledge, and experience in the creation of spin-offs. Therefore, a specialized unit for technology transfer can be one of the initiatives that the university can adopt to develop the entrepreneurial ecosystem, providing resources and knowledge for the creation of new companies.



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Another strategy addressed in the literature is the offering of training and capacity-building programs for local entrepreneurs, as well as providing resources and infrastructure to support the development of startups and innovative businesses (Veki ; Borocki; Fajsi, 2019; Thomas; Faccin; Asheim, 2021; Pupp; Filep, 2021). This can help create an environment conducive to the emergence and growth of new ventures. For Pupp and Filep (2021), it is important to encourage the creation of joint ventures between professors, students, and local companies, promoting the transfer of knowledge and technology to the community. This can be done through collaborative research projects, internships in local companies, and other initiatives that bring the university closer to the business sector. According to Veki , Borocki, and Fajsi (2019), the university can also develop an entrepreneurial culture by encouraging innovation, creativity, and the search for solutions to social and economic problems. This can be achieved through business incubation programs, hackathons, startup competitions, and other initiatives that stimulate entrepreneurship among students and professors.

All the studies analyzed suggest the importance of positioning universities as “entrepreneurial universities.” Etzkowitz (2013) describes the anatomy of the entrepreneurial university, which can be expressed in four interrelated propositions: interaction, interdependence, hybridization, and reciprocity. This implies that the university should be open to interaction with other stakeholders, including companies, governmental and civil society organizations, and should work closely with them to create a more favorable and sustainable business environment. According to Pupp and Filep (2021), to become an entrepreneurial university, it is necessary to promote an almost total structural change to be able to respond autonomously to emerging challenges. The entrepreneurial university is a natural incubator that supports professors and students in creating joint ventures and other entrepreneurial initiatives.



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## CONCLUSIONS

The literature review highlights the importance of strategies to strengthen the university's role in building an entrepreneurial ecosystem. There is consensus among authors that the university can adapt foreign models to local conditions instead of simply replicating them. The adoption of orchestration practices consolidates the role of universities as local leaders, promoting new projects for the ecosystem and strengthening their role as a "hub organization." Offering training and capacity-building programs, providing resources and infrastructure, encouraging the creation of spin-offs and startups, promoting joint ventures, and fostering an entrepreneurial culture are also strategies addressed in the literature. Additionally, the creation of a specialized technology transfer unit can contribute to the development of the entrepreneurial ecosystem.

The impact of higher education institutions that adopt the Entrepreneurial University model has become evident. These institutions are described as those that interact, hybridize, and reciprocally collaborate with other stakeholders, aiming to create a more favorable and sustainable business environment. In this way, it is possible to support the creation of entrepreneurial initiatives by professors and students, in collaboration with other actors in the entrepreneurial ecosystem.

The literature on entrepreneurship and innovation ecosystems presents a significant gap when it comes to research focused on challenging contexts, especially in regions with low social indicators. In these locations, sustainable economic development plays a crucial role in improving the quality of life for communities. It is essential to direct efforts toward understanding the specific dynamics of these contexts and identify effective strategies that can drive socioeconomic advancement.



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