

RESEARCH PAPER

# The third mission of universities: the entrepreneurial university

Yuri Borba Vefago<sup>1</sup>, Andréa Cristina Trierweiler<sup>1</sup>, Luciano Barcellos de Paula<sup>2,3</sup>

<sup>1</sup>UFSC – Federal University of Santa Catarina. Center for Science, Technology and Health. PPGTIC – Postgraduate Program in Information and Communication Technologies, Araranguá, SC, Brazil.

<sup>2</sup>CENTRUM Católica Graduate Business School, Jirón Daniel Alomía Robles 125, Urbanización Los Álamos de Monterrico, Santiago de Surco 15023, Lima, Perú.

<sup>3</sup>Pontificia Universidad Católica del Perú, Av. Universitaria 1801, San Miguel 15088, Lima, Perú.

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## ABSTRACT

**Goal:** This article aims to analyze the productions in scientific journals of international bases, in English, Portuguese or Spanish, about entrepreneurial university and third mission, focusing on the productions of Brazilian authors, through a systematic search of the literature.

**Design / Methodology / Approach:** We use the SSF - Systematic Search Flow method, which is applied in systematic and integrative reviews.

**Results:** An entrepreneurial university, committed to the development of its region, is the key factor in achieving regional innovation, a key institution in knowledge-based societies. In the age of knowledge, the university is as important as industry and government; fundamental for the development of knowledge and innovation. As a result, we identified research challenges and opportunities, contributing to the construction of a panorama of Brazilian scientific production in international journals on the themes entrepreneurial university and third mission.

**Limitations of the investigation:** The most important limitation in this study was the long-time collection of research data.

**Practical implications:** Universities must strengthen their relationship with industry and government to transfer knowledge and, at the same time, demonstrate their contribution to the community, fulfilling their third mission, as a vector for regional socioeconomic growth.

**Originality / Value:** We see the opportunity to consolidate studies on the relationship between the third mission and the entrepreneurial university appropriate to the Brazilian reality.

**Keywords:** Systematic Search; Entrepreneurial University; Regional innovation; Ivory Tower.

## INTRODUCTION

Nowadays, the university faces several challenges, among them, the questioning of its role and its actions, besides teaching, that is, its capacity of approaching the community, in terms of research and extension. After all, in the Brazilian context, the principle of inseparability teaching-research-extension constitutes the fundamental axis of the university, which should contribute to the approximation between university and society. (Albulescu et al., 2014).

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**Corresponding author:** andrea.ct@ufsc.br, andreatri@gmail.com

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From the 19th century, it has been used to designate an environment of intellectual pursuit disconnected from the pragmatism, practical concerns of everyday life (Shapin, 2012). According to Shapin (2012):

The notion of the Ivory Tower became part of twentieth- and twenty-first-century cultural vocabularies, especially in the 1930s and 1940s, in which it became a common term attached to universities and to features of science and in which it became a way of criticizing practices and institutions deemed to be 'irrelevant' (p. 1). By the second part of the twentieth century it became natural to think of the Ivory Tower as the university or at least as some version of what a university was or might be [...], with the idea of the university as a defective institution, needing correction and reform (p. 14).

The university was conceived as an environment of teaching and research, which gravitates in an intellectual sphere, often seen as disconnected from the practices of everyday life, precisely in what could form an ivory tower. Such discussion is revisited by Etzkowitz et al. (2000) in his article, "The future of the university and the university of the future: evolution of ivory tower to entrepreneurial paradigm".

The role of the University goes beyond the traditional teaching function, considered as its first mission, to become an Entrepreneurial University, which seeks to achieve research (2nd mission) and the market (3rd mission), through the emergence of innovation as well as by its role as protagonist of economic and social development (Audy, 2017).

Complementarily, Etzkowitz (2017) establishes two revolutions, the first marks the legitimation of research activities, and the second, highlights a scenario in which academia is encouraged to conduct a creative function for economic and social development, activities characteristic of a really entrepreneurial university!

Universities become more closely involved in the innovation process; Thus, as the academy adopts an entrepreneurial format, it transcends and incorporates its traditional teaching and research missions. In a knowledge-based society, university is fundamental institution, even though industry and government remain protagonists in their fields. After all, the university has its competitive advantage linked to the continuous flow of its students, which promote a constant movement of new ideas, which is not a simple task for other institutions that produce knowledge (Etzkowitz and Zhou, 2017).

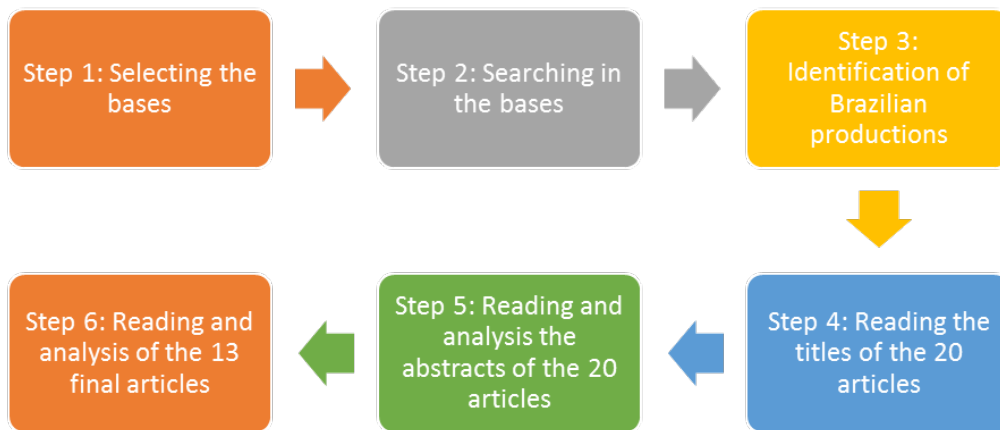
According to Audy (2017), the impacts of the second revolution are significant for universities, since they establish new challenges and opportunities, requiring new forms and positioning in interactions with other actors in society. The reorganization of new academic structures is fundamental to the promotion of a more coherent response, according to the demands of this new reality. Therefore, maintaining the organizational core and values of the institution is crucial for directing new strategies during the planning process.

Thus, the aim of this paper is to analyze the productions in international journals by Brazilian authors about the entrepreneurial university, through a systematic literature search. To this end, we will present definitions and main contributions of the portfolio articles in this theme, as well as the methodological aspects of the systematic search and its results.

## **METHODOLOGICAL PROCEDURES**

In order to ensure repeatability in the process of searching scientific databases, we used the SSF - Systematic Search Flow method, suitable for systematic and integrative reviews (Ferenhof and Fernandes, 2016). The method is divided into 4 steps and 8 activities: (1) Research Protocol, (2) Analysis, (3) Synthesis and (4) Writing.

The search took place in 06 stages, as shown in Figure 1: (1) Survey of the bases; (2) Search in the selected databases, using the descriptor: "(\"entrepreneurial universit\*\" OR \"third mission\")"; (3) Identification of the productions of Brazilian authors (considering the 1st author); (4) Reading of article titles; (5) Reading and analyzing abstracts to verify those that aligned with the entrepreneurial university theme; and (6) Full reading and analysis of articles for portfolio construction.



**Figure 1.** Methodological design  
**Source:** Authors.

**RESULTS**

We conducted the search in Scopus and Web of Science, resulting in 929 records, but 909 of them were not published by Brazilian authors (considering the first author), leaving 20 articles for analysis of title and abstract consistency (qualitative analysis), verifying their relationship with the theme “entrepreneurial university” and / or “third mission”, which resulted in 13 articles.

Table 1 shows the scientific journal of the articles, both those that make up the final portfolio, selected for analysis (13 articles), and those initially collected (20 articles).

**Table 1.** Number of publications collected and analyzed

Scientific Journals	Number of articles	
	Analyzed	Coleted
<i>Caderno CRH</i>	1	1
<i>Education and Training</i>	0	1
<i>Espacios</i>	2	3
<i>Estudos Avancados</i>	1	1
<i>Foresight and Sti Governance</i>	0	1
<i>Industry and Higher Education</i>	1	1
<i>Innovation &amp; Management Review</i>	1	1
<i>International Entrepreneurship and Management Journal</i>	1	1
<i>Journal of Studies in International Education</i>	1	1
<i>Journal of Technology Management and Innovation</i>	1	1
<i>Polem!Ca</i>	0	1
<i>Revista Brasileira de Gestao e Desenvolvimento Regional</i>	1	1
<i>Revista Eletronica Pesquiseduca</i>	0	1
<i>Revista Eniac Pesquisa</i>	0	1
<i>Revista Gestao &amp; Tecnologia-Journal of Management and Technology</i>	1	1
<i>Science and Public Policy</i>	0	1
<i>Sociedade e Estado</i>	1	1
<i>Technological Forecasting and Social Change</i>	1	1
<b>Total</b>	<b>13</b>	<b>20</b>

**Source:** Authors.

Table 2 presents the scientific journal, author(s), year of publication, and title of portfolio articles.

**Table 2.** Articles portfolio

Journal	Author(s)/Year	Title
Revista Brasileira de Gestão e Desenvolvimento Regional	Souza and Palma (2010)	Ivory tower or entrepreneurial university: Critical factors in the innovation processes in an university context
Industry and Higher Education	Amaral et al. (2011)	Building an Entrepreneurial University in Brazil: The Role and Potential of University-Industry Linkages in Promoting Regional Economic Development
Caderno CRH	Castro (2011)	Universities and innovation: Institutional configuration & Third Mission
Sociedade e Estado	Ferreira et al. (2012)	Gestão da interação Universidade-Empresa: O caso PUCRS
Estudos Avancados	Audy (2017)	A inovação, o desenvolvimento e o papel da Universidade
Espacios	Gomes et al. (2017)	Entrepreneurial university: A study on the differences between Brazil and the model done in the United States
Espacios	Lorentz et al. (2017)	The entrepreneurial behavior of directors of a public education institution and their perception about the entrepreneurial university
International Entrepreneurship and Management Journal	Schmitz et al. (2017)	Innovation and entrepreneurship in the academic setting: a systematic literature review
Technological Forecasting and Social Change	Dalmarco et al. (2018)	Creating entrepreneurial universities in an emerging economy: Evidence from Brazil
Journal of Technology Management and Innovation	Gimenez and Bonacelli (2018)	Higher education and society: An exploratory study on practices of the third mission at the University of Campinas (unicamp)
Innovation & Management Review	Alves et al. (2019)	Determinants of student entrepreneurship An assessment on higher education institutions in Brazil
Revista Gestao & Tecnologia-Journal of Management and Technology	Moura Filho et al. (2019)	Entrepreneurial university - a method of evaluation and planning applied in Brazil
Journal of Studies in International Education	Sandes-Guimaraes et al. (2019)	International Student Mobility Programs Change Student Entrepreneurial Perceptions

**Source:** Authors.

### **Systematic analysis on third mission and Entrepreneurial University**

The systematic literature analysis allowed the identification of aspects of interest related to the themes “third mission” and “entrepreneurial university” in the portfolio articles, definitions, typologies, characteristics, among other theoretical contributions to understanding the subject under study.

#### **The third mission of universities**

It is necessary to consider academic revolutions to understand the third mission of universities. The role of the University transcends the traditional teaching function, as its first mission, to become an Entrepreneurial University from the scope of research and extension. Thus, Etzkowitz (2017) establishes two revolutions: the first refers to the legitimation of research activities and the second, highlights a scenario in which academia is urged to conduct a creative function for economic and social development, characterizing the entrepreneurial university!

Audy (2017) argues that the impacts of the second academic revolution are significant for universities, generating new challenges and opportunities, in which institutions must build a new positioning in relation to other actors. This environment puts pressure on the relationship between teaching, research and innovation within the university as well as its relationship with business and government.

The third mission considers the relations of universities with society, through the provision of services, fostering entrepreneurship and innovation, acting for socioeconomic development, local and regional. Universities are urged to extend and strengthen their actions beyond their walls.

The third mission still generates many discussions, often related to the capitalization of knowledge, entrepreneurship, innovation and technology transfer activities, which are close to the US model (Gimenez and Bonacelli, 2018). However, the third mission is multifaceted and has economic and social dimensions, considering not only the transfer of knowledge and technology through licenses and contracts with industry, but also the strengthening of their participation in social and cultural life.

According to Amaral et al. (2011), based on Etzkowitz (1994), the Triple Helix thesis considers that as a result of the second academic revolution, academia is capable of, or should become, entrepreneurial and thus form the basis for regional economic development. Thus, the university must: (1) be a repository of research with commercial potential; (2) have tradition in the generation of startups; (3) have an entrepreneurial spirit; (4) have intellectual property policies; (5) share profits and mediate conflicts of interest; and (6) have an active participation in building regional innovation strategies.

#### **The entrepreneurial university**

Originated by Henry Etzkowitz, the concept of entrepreneurial university was first cited in the publication: “Entrepreneurial Scientists and Entrepreneurial Universities in American Academic Science” (1983). The entrepreneurial university is the result of a next step in the development of a single institution, a third mission for economic, social and regional development (Etzkowitz, 2013), in which the traditional university model, called the Ivory Tower, is replaced and incorporated by a model, the entrepreneurial university (Etzkowitz and Zhou, 2017).

Regarding the entrepreneurial university definitions, we obtained:

Amaral et al. (2011, pp. 2-3) state that:

An entrepreneurial university encompasses teaching, research and the service of society, by means of concurrent tripartite cooperation rather than linear processes. Academics play a new role, adding value in companies; and this learning process improves education and research. Equally, researchers’ findings and new methodologies improve teaching

practices. It is a continuous process of creating, acquiring, packaging and disseminating knowledge.

According to Lorentz et al. (2017, p. 4) an Entrepreneurial University is able to understand and approach the demands of a wider society, transforming them into the basis of new research projects and intellectual paradigms. which contributes to building a virtuous cycle with internal intellectual development.

Schmitz et al. (2017, p. 10) use the following authors to define an entrepreneurial university:

According to Audretsch (2014), universities need to become more entrepreneurial in order to facilitate knowledge spillovers and the commercialization of their knowledge. As a conduit of knowledge spillovers, entrepreneurial universities contribute to economic and social development through its multiple missions (Guerrero et al., 2014). It is seen as an important catalyst for regional economic and social development because it generates and exploits knowledge as entrepreneurial opportunities (Urbano and Guerrero 2013). Therefore, the concept of the entrepreneurial university is seen as the most well-articulated in the evolution of the university towards the requirements of the knowledge-based society (Goldstein 2010), in which the role of the university for socioeconomic development and the collaboration between university and external stakeholders is emphasized (Sam and van der Sijde 2014).

Moura et al. (2019, cited in Etzkowitz and Zhou, 2008, p. 5), state that “[...] the university's contribution to innovation in terms of economic and social development is the heart of the Entrepreneurial University concept”.

According to Ferreira et al. (2012), an entrepreneurial university can be understood as an active institution, which promotes changes in its structure and in the way it responds to internal and external demands.

Dalmarco et al. (2018, cited in Ivanova and Leydesdorff, 2014), who state that the concept of entrepreneurial university is associated with the transfer of knowledge to companies, with the aim of stimulating socioeconomic development. In this sense, the authors state that the emergence of entrepreneurial universities around the world can be classified as “waves of development”, which were responsible for changing organizational structures in different regions and countries.

- (1) The first wave is the US universities, particularly MIT, Stanford, and the University of Wisconsin, which have gained notoriety in establishing a university policy and technology transfer policy, consolidating research and development partnerships, and generation of new ventures.;
- (2) The second wave of development took place in Western Europe, with the transformation of universities into entrepreneurial institutions with commercially responsive conditions in the face of the social and economic demands of stakeholders as well as the consolidation of infrastructure for academic entrepreneurs; and
- (3) The third wave is emerging economies, with academic entrepreneurship at the top of their political agenda; while they still lack consistent policies and structures for the proper promotion of academic knowledge transfer, incubation of start-up firms, and possibly the contribution to socioeconomic development.

### **Entrepreneurial university and the third mission in international Brazilian literature**

By studying a recent literature on innovation and entrepreneurship in academia through a systematic literature review, the study by Schmitz et al. (2017, p. 17) allowed the identification, in terms of content analysis, of the most recurrent terms related to this theme, namely: (1) academic innovation, (2) university innovation, (3) innovative university, (4) academic entrepreneurship, (5) university entrepreneurship and (6) entrepreneurial university - notably the latter, which according to the authors, represents a better university that uses as

missions of creation, dissemination and application of knowledge for economic and social development, as well as seek better sustainability for itself.

According to Audy (2017) with the highlighting of the third mission, universities embrace a new and renewed challenge, transcending teaching and research, to play a fundamental role in the development of society. The innovation emerges as the engine of the transformation process, leading research to society, acting as a source of problem solving and opening new possibilities. Innovation environments emerge as the locus where the performance of universities manifests itself very strongly, in connection and interaction with business, government and society.

Gomes et al. (2017) seek to analyze the differences between an entrepreneurial university in Brazil and the United States, while pointing out solutions to reduce the gap between models. In Brazil: (1) students experience late contact with scientific production and entrepreneurship education, and during undergraduate studies there is little structure for developing research and encouraging entrepreneurial activity; (2) financial support is insufficient; and (3) lack of an effective innovation system.

The article by Souza and Palma (2010) entitled: "Ivory Tower or Entrepreneurial University: critical factors in the innovation process in the university context", suggests that the barriers and drivers of Brazilian scientific research are similar to research from American and European universities. Among the barriers, the following stand out: (1) lack of human resources; (2) excess internal bureaucracy; (3) lack of interaction between centers; (4) lack of interdisciplinarity between the Institution's centers; (5) professors with excessive workload in the classroom. One can observe the weakness in the university-business interaction and government that still makes this institution a "Tower of Ivory".

Amaral et al. (2011) analyzed the effects of university-industry collaboration, from the perspective of local actors (case study). They realized that academic and ideological culture were not the biggest barriers to transforming the university under study into an entrepreneurial university, due to the experience of some professors who had already worked with industry. However, excessive bureaucracy and lack of leadership were found to be potential problems.

According to Castro (2011), there are a variety of barriers for the government to find the policy and effective incentive for the various parties to articulate themselves in a minimally sustained innovation system. The government continues to call itself more than it should, and the increase in benevolence (cheap and in-depth financial resources) has so far failed to gain the expected support from the business sector. Historically, development models have not encouraged entrepreneurship to take risks.

The Brazilian legal regime is misaligned with the policies of Science, Technology and Innovation, which contributes to the lack of confidence in the government proposals, which presents inconsistent policies. However, according to Castro (2011, p. 15): "[...] we begin to learn from experience and refine policies, rather than simply discarding and replacing them". In addition, one of the main challenges is related to the low production and dissemination of relevant information, which contributes to the interaction, especially with the business sector, which is the space to be occupied by the university.

Ferreira et al. (2012) highlight the importance of establishing support structures as interlocutors between academia and business. That is, translating research questions into a business language while allowing researchers to direct their attention to activities that relate to their specialty.

Analyzing the perception of school heads regarding the entrepreneurial university, Lorentz et al. (2017) found that the best understood aspect was interaction with the community and economic and social development. For these authors, investigating the perceptions of directors about the entrepreneurial university can generate behaviors towards the implementation of entrepreneurial actions or projects.

According to Dalmarco et al. (2018), although there is a time lag between the first, second and third wave, some Brazilian universities started their entrepreneurial activities during the



second wave. However, the concept was only institutionalized in Brazilian universities from 2004, with the approval of the Innovation Law. For the authors, Brazil has an environment characterized by an outdated industrial sector, operating separately from academic activities, in which startups can help in the university-industry relationship.

## FINAL CONSIDERATIONS

The aim of this article was to analyze the productions in internationally based scientific journals - in English, Portuguese or Spanish, about entrepreneurial university and third mission, focusing on Brazilian authors, through a systematic literature search. Thus, it was possible to identify the effects of the implementation of entrepreneurial universities as well as the disclosure of the third mission in the Brazilian context.

It was possible to infer that the national scientific production on entrepreneurial university and third mission is still low and irregular; Although internationally, the concepts are often debated for at least two decades, which demands greater attention to the construction of Brazilian literature, which promotes debate and contributes to the consolidation of appropriate policies and structures.

Regarding the third mission of universities, it is clear that the concept still generates many discussions as well as the types of activities and relationships involved. After all, according to Gimenez and Bonacelli (2018), the third mission is constantly related to the activities of capitalization of knowledge, entrepreneurship, innovation and technology transfer, which is close to the American model of university. However, activities that do not involve these relationships, even if they include the approach of academia to society, are associated with extension activities.

In Latin America, extension activities are related to social projects aimed at vulnerable groups. However, although there are currents contrary to the university's involvement with the demands of the productive sector, the concept of extension is increasingly connected to that of the third mission and both must lead to the transfer of knowledge to society. At this point, we see the opportunity to consolidate studies on the relations between the third mission and extension, appropriate to the Brazilian reality.

As an emerging country, Brazil is in the third wave of development, with academic entrepreneurship at the top of its political agenda. Nevertheless, the establishment of adequate policies and structures are gaps to be remedied to provide the means and legal certainty for universities to perform, which Etzkowitz and Zhou (2017) advocate as a key driver of economic and social development.

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