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Dimensions of a metamodel of an entrepreneurial university

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The absence of a metamodel that is able to represent the main representations in literature, and to gather, synthesize the essential components that makes up the entrepreneurial university, reduces our capacity for understanding the underlying complexities of this subject matter. The objective of this article is to propose a reflection on the main representation models of the entrepreneurial university, seeking to build a conceptual metamodel that consists of dimensions that synthesize, gather, delimit and integrate the main existing frameworks in the literature on the entrepreneurial university. This study identified and included in its analysis four main frameworks that are fragmented and scattered in the literature on the entrepreneurial university. This paper contributes by offering an integrated and extended metamodel that has the power to increase our understanding about the meaning of the entrepreneurial university and emphasize gaps that deserve special attention in this field.

Key words: Entrepreneurial University, entrepreneurship, innovation, opportunity.

INTRODUCTION

The frameworks of entrepreneurial universities that appear in the international literature suggest readings from different perspectives based on the temporal and spatial dimensions in which they were developed. The main analyses and propositions of analytical frameworks have their origins in North America and Europe and assist in the understanding of parts of the dynamics of the entrepreneurial university and its connections with the transformation processes within organizations (Clark 1998; 2004; Sporn, 2001; Rothaermel et. al., 2007; Yusof and Jain, 2010; Etzkowitz, 2001; 2004; Bratianu and Stanciu, 2010; Gibb et al., 2009; Nelles and Vorley, 2009;

Farsi et al., 2012; Guerrero and Urbano, 2012, Kirby, 2006; Siegel et al. 2007). The different ways in which each of the major frameworks of entrepreneurial universities can be read and understood, produce rich, complex and divers perspectives on organizations, which are supported by various theories of organization (Hatch, 1997).

The frameworks of entrepreneurial universities based on a synthesis of the literature (Rothaermel et. al., 2007, Yusof and Jain, 2010, Nelles and Vorley, 2010, Kirby, 2006), or on theoretical and empirical observations (Cark 1998; 2004, Etzkowitz, 2001; 2004), contribute to a

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conceptual densification of the field, since each mentions some element that represents the entrepreneurial university in one way or another. However, these representation frameworks have converging and non-converging elements that could be synthesized, gathered and integrated in a single model, which could lead to a broader and integrated understanding of the phenomenon of the entrepreneurial university. To construct a broad, complete and integrated preliminary notion of the entrepreneurial university and its constituent aspects, a reading is necessary of each of the major frameworks that are scattered and fragmented in the literature. The absence of a metamodel that is able to represent the main representations in literature, and to gather and synthesize the essential components that makes up the entrepreneurial university, reduces our capacity for understanding the underlying complexities of this subject matter.

The abstraction of a conceptual metamodel of the entrepreneurial university that is made up of dimensions and supported not only by the major frameworks in the literature, but also by the creating shared value (CSV) approach, may elevate and broaden our understanding of the phenomenon of the entrepreneurial university by reconceptualizing products or services, redefining productivity in the value chain, and by developing local clusters (Porter and Kramer, 2011). The CSV principles offer new possibilities for the university to restructure its roles and relationships with the agents and actors that surround it. An initial literature review reveals that some elements that comprise the CSV approach, such as the process of understanding, creating and delivering value and connections with agents and actors that surround the university, are just starting to be developed in the literature on the entrepreneurial university, with only limited reflections on one of the essential roles of the entrepreneurial university: the delivery of superior value, in a shared way, to the stakeholders.

The studies on universities conducted by Clark (1998, 2004) paved the way by launching the first conceptual foundations on the entrepreneurial university and the entrepreneurial steps of transformation. Ever since Clark raised the issue and the discourse of the entrepreneurial university, the international scientific community has been interested in investigating the changes in this model of organization, as the growing expansion of the literature on entrepreneurial universities in the United States and Europe identified by Rothaermel demonstrates. By reviewing the literature in academic journals in the United States and Europe between 1981 and 2005, Rothaermel et al., 2007 sought to highlight issues that were relevant to the research field of the entrepreneurial university and to establish a classification (Rothaermel et al., 2007). Because it was a survey of academic articles, the analysis did not include the first conceptual contributions on the entrepreneurial university from Clark (1998; 2004),

or the analyses from Gibb et al. (2009) that outline the concepts of the entrepreneurial university.

The transition from a modern to a postmodern society (Hatch, 1997) has led the university to adapt to the environment through internal transformations, such as through changes in governance, management, flexibility and leadership structure, in order to increase its flexibility, efficiency and effectiveness (Sporn, 2001; Gibb, 2002; Hassard, 1999). This transition from modern to postmodern society requires an investigation of the new organizational forms, roles and propositions that are restructuring higher education, so that the university can contribute to the social and economic growth of the nation (Clark, 1983; Etzkowitz et al., 2012, Martin, 2012; Goddard et al., 2012; O'shea et al., 2007; Bathelt et al., 2010).

Although there has been an exponential growth in the international literature on entrepreneurial universities between 2000 and 2005 in the developed countries, as Rothaermel et al. (2007) have pointed out, in the Brazilian emerging economy the topic is still in its infancy, at least among the scientific administration community. The fledgling presence of the entrepreneurial university in the Brazilian administration literature has resulted in gaps and ruptures. First, Brazilian scientific production in this research field is distancing itself from the one in countries of the Northern Hemisphere (U.S. and Europe). Second, the research field of entrepreneurial universities is being deprived of interpretative models of contemporary phenomena that are linked to entrepreneurship and innovation taking place in Brazilian universities. And third, some Brazilian institutions are implementing entrepreneurial practices that constitute empirical evidence of the existence of entrepreneurial universities, but these are not being properly explored and analyzed in scholarly administration articles (Closs et al., 2012; Costa et al., 2008; Costa et al., 2010).

We present three illustrative examples of the Brazilian higher education system. The first refers to the initiative of the leaders of the federal Brazilian institutions of higher education to establish a standing committee of entrepreneurship in 2010 at the national association of directors of federal institutions of higher education (ANDIFES in the Portuguese acronym) in order to promote entrepreneurship and formulate policies, programs and institutional actions based on the principles of entrepreneurship at the federal public universities. This association brings together 59 federal universities and higher education institutions with more than one million two hundred thousand students, which have models of organizations that are supported bureaucracy (Franco, 1984; Sleutjes et al., 1998; Vieira and Vieira 2003, 2004; Dellagnelo and Machado-da-Silva, 2000). The second example comes from the entrepreneurial university seminar held in 2010 by the forum of deans of extension of Brazilian public universities (FORPROEX in the

Portuguese acronym), which aims to stimulate and reflect on entrepreneurship in public universities, and to formulate a set of systemic actions in Brazilian public universities. The seminar allowed its participants to reflect on the key issues involving this model and their impacts in Brazil. The third example, refers to the set of practices related to entrepreneurship that have been ongoing in some Brazilian universities for at least ten years, practices that are not included in Brazilian academic administration studies. Some of the universities and higher education institutions that stand out in entrepreneurship and are on a path to becoming an entrepreneurial university are (Etzkowitz et al., 2005): the Universidade Federal de Itajubá (MG), the Fundação Getulio Vargas in São Paulo (FGV), and the Pontifícia Universidade Católica of Rio de Janeiro and Pontifícia Universidade of Rio Grande do Sul (PUC-RJ and PUC-RS).

On one hand there are the entrepreneurial practices in some Brazilian universities, characterized by programs, projects and actions that, to date, are not getting the proper attention from Brazilian business administration researchers, and on the other, the incipient Brazilian scientific production on the entrepreneurial university. The chasm and gaps between these sides put this field of research under tension in Brazil (Philport et al., 2011). Because of the gaps laid out before, this paper seeks to analyze the literature regarding the key conceptual frameworks about entrepreneurial universities and the CSV approach, and to identify which model would be more feasible to synthesize, gather, delimit and broaden our understanding about the main aspects that affect entrepreneurial universities, in addition to studying to what extent evidence can be found of the application of the proposed model in the entrepreneurial practices of universities (Etzkowitz et al., 2005, Costa et al., 2010).

The objective of this article is to propose a reflection on the thinking and the main representation models of the entrepreneurial university, seeking to build a conceptual metamodel that consists of dimensions that synthesize, gather, delimit and integrate the main existing frameworks in the literature on the entrepreneurial university. The conceptual metamodel proposal is based on dimensions that enable an understanding of the CSV approach in universities. This study identified and included in its analysis four main frameworks that are fragmented and scattered in the literature on the entrepreneurial university: (i) Clark's (1998, 2004) entrepreneurial pathways of university, (ii) Etzkowitz' (2001, 2004) norms of the entrepreneurial university, (iii) Rothaermel's (et al., 2007) conceptual framework of the entrepreneurial university and (iv) Kirby's (2006) strategic actions of the entrepreneurial university. CSV is inserted in this debate because it includes the notion of capturing, creating and delivering value, which enables the understanding of the involvement, commitment and

relationship of the university with the institutions and organizations in its periphery. This paper contributes by offering an integrated and extended metamodel that has the power to increase our understanding about the meaning of the entrepreneurial university.

MATERIAL AND METHODS

This study is exploratory and qualitative in nature. The adopted methods and procedures are based on reflexive processes that enable the development of a logical structure of reasoning. The qualitative approach is linked to the reflexive methodology, which is interpretative, political and rhetorical in nature, according to Vergara (2010), who based himself on Alvesson and Sköldbberg (2000). The basic question of this study led the development of the research and the review of the literature on the entrepreneurial university and CSV. The adopted methodological procedure was that of the bibliographic research and this enabled the identification and classification of the information that was gathered and judged as essential for the discussions. The following categories, keywords, were defined as search criteria: entrepreneurial university, entrepreneurship, innovation, creation of shared value and economic and social development. Next, printed and digital Brazilian business administration journals were consulted in the period from 1978 to 2012, classified in 2012 at the Qualis A2 and B1 levels. At the international level, the journal database of the coordinating center for the Improvement of higher education personnel (CAPES in the Portuguese acronym) was consulted.

In the second stage of this study, a pre-analysis was performed to identify the authors with an outstanding publication in the fields of entrepreneurial universities and CSV and with contributions on the analyzed subject matter. In this step we also classified the national and international articles along six axes:

discussions establishing a review of the literature, concepts and analyses of the most important entrepreneurial university models, (ii) reflections on the concepts and principles of entrepreneurship, (iii) reflections on innovation, (iv) discussions on the concepts and principles governing CSV, (v) concepts and notions of corporate social responsibility, and (vi) notions of economic, social and cultural development.

In the third step the elements with a sufficient level of significance were subjected to content analysis, the adopted technique for data processing. We identified what was being said about a particular topic in the context of the relevance of the previously raised categories (Bardin, 1977). Content analysis was chosen because of its adherence and alignment with the reflexive

methodology (Orr and Bennett, 2009; Gearity, 2011). Table 2 presents the elements identified in the literature review, which served as support to outline the conceptual framework of the entrepreneurial university and to identify the key aspects that contributed to the emergence of the underlying dimensions of the analysis model. The content analysis technique focused on data processing (Bardin, 1977) enabled the identification of what was being interpreted in relation to the main models of the entrepreneurial university and CSV.

The pressures on the university

The universities are embedded in a dynamic environment and that the economic, social, political-legal, demographic, environmental and technological variables that are emerging in postmodern society are forces that push and stretch the governance, management and leadership structure of universities to increase its flexibility, efficiency and effectiveness (Clark, 2001; Sporn, 2001; Axley and McMahon, 2006; Carbone, 1994; Conceição and Heitor, 1999; Etzkowitz et al., 2000). The notion of the adaptive university proposed by Sporn (2001) is a new form of organization, which has flexible, adaptive and transformational attributes in its structures and processes in response to the external environment. This involves new procedures for managing relationships at all levels of the university (strategic, tactical and operational), new structures of authority and new ways of allocation resources (Audretsch and Lehmann, 2005).

The different variables that push and stretch the university are a result of globalization and cause impacts on these organizations (Gibb, 2002; Hardy and Fachin, 1996; Parker, 1999). The revolution in information and communication technology, the removal of barriers to international trade, the growth of trade blocs of developed and developing countries, and the mobility of international capital are just some of the pressures that globalization is putting on organizations to pursue agility in decision-making processes, in changing internal processes and in looking for high performance in administrative practices (Gibb, 2002).

It has become imperative that universities innovate and restructure to adapt themselves to the challenges of postmodern society. The internal and management structures of universities, which for the last several decades seemed to be solid, are crumbling because of the adjustment to variables that have emerged in postmodern society (Berman, 1982). A sign of this change in university organizations is the European consortium of innovative universities comprising of 11 European universities and three partner universities in Mexico, innovation and entrepreneurship in their institutions and to encourage innovation in industry and society (Goddard Russia and Australia. Its aim is to develop a culture of et

al., 2012; Urbano and Guerrero, 2013; Gibb and Hannon, 2006; Gibb et al., 2009). Table 1 summarizes the aspects and elements of each model of the entrepreneurial university

Entrepreneurial pathways of university transformation

In his analysis of five European universities undergoing change, Clark (1998) identified a set of elements, which he called entrepreneurial steps to the transformation of the university that were prevalent in the analyzed organizations. These steps reveal the trajectory that was chosen by the organization to transform itself into an entrepreneurial university and they are elements of the analysis model, namely: a strengthened steering core, an expanded developmental periphery, a diversified funding base, a stimulated academic heartland and an integrated entrepreneurial culture.

His study indicated that the five universities became more adaptive (Sporn, 2001) to the demands imposed by the external environment, by adopting the entrepreneurial steps to the transformation of the organization. Based on the results obtained for the 5 universities, Clark (1998) then outlined the contours of the concept of the entrepreneurial university, establishing connections with the notion of innovation, energy, leadership and the pursuit of opportunities, all aspects that are inherent to the behavior of individuals in educational organizations.

The entrepreneurial university is an entrepreneurial organization with new and emerging organizational forms that have the capacity to disrupt and reorganize administrative and academic practices (Clegg and Hardy, 1999; Clark, 2001). It's the individuals working within the university, however, who shape entrepreneurial behavior, implementing changes and adjustments with their entrepreneurial skills. Individuals who find themselves in the entrepreneurial university have innovative behaviors and attitudes geared towards creating a strong sense of ownership, strengthening the sense of freedom and autonomy, maximizing opportunities, developing responsibilities to visualize the various aspects surrounding them, encouraging strategic thinking and learning from stakeholders (Gibb, 2002; Lumpkin et al., 2005).

Initially, Clark's framework (1998) of the entrepreneurial university focuses attention on the characteristics that shape the entrepreneur, which are associated with recognizing new opportunities for the university in its internal and external environment (Dutta and Crossan, 2005; Lumpkin et al., 2005; Short et al., 2010). These entrepreneurial characteristics are inherent to the dimension of the individual operating in the university and encourage a shift from a traditional organization to an entrepreneurial organization. Entrepreneurship stimulates

Table 1. Key issues included in the entrepreneurial university frameworks

| Clark (1998, 2004) | Etzkowitz (2004) | Kirby (2006) | Rothaermel (2007) |
|------------------------------------|---------------------------------|--|---|
| Strengthened steering core | capitalization | Endorsement | University Entrepreneurship |
| Expanded developmental periphery | interdependence independence | Incorporation Implementation | Technology transfer productivity Creation of firms |
| Diversified funding base | hybridization reflexivity | Communication Encouragement and support | Environmental and innovation network |
| Stimulated Academic heartland | | Recognition and reward | |
| Integrated entrepreneurial culture | | Organization Promotion | |

Table 2. Elements from literature to support of the metamodel of entrepreneurial university

| Category | References | Elements | Dimensions |
|-----------------------------|--|---|--|
| Entrepreneurial University | Audretsch and Lehmaan (2005) | new organizational forms | entrepreneurial vision committed strategic leadership |
| | Axley and Clark(1998,2004) | | |
| | Costa et Al. (2010) | | |
| | Dellagnelo and Machado-da-Silva (2000) | entrepreneurial pathways of university transformation | |
| | Martin (2012) | | |
| | Farsi et al., (2012) | | |
| | Etzkowitz (1997, 1998, 2001, 2004) | | |
| | Etzkowitz et al.(2000; 2012) | the norms of the entrepreneurial university | |
| | Hardy nd Fachin (1996) | | |
| | Kirby (2006) | | |
| | Rothaermel et al. (2007) | | |
| | Sporn (2001) | | |
| | Yusof and Jain (2010) | | |
| Bratianu and Stanciu (2010) | | | |
| Gibb and Hannon (2006) | taxonomy of the literature | | |
| Gibb et al. (2009) | | | |
| Marcovitch (1979) | | | |
| Nelles e Vorley (2009) | | | |
| Parker (1999) | | | |

Table 2. Cont'd

| Category | References | Elements | Dimensions |
|---------------------------------|---|--|--|
| Innovation | Philpor et al. (2011) Poyago-theotoky et al. (2002) Guerrero and Urbano (2012) Sleutjes and Oliveira (1998) Siegel (2010) Vieira and Vieira (2003, 2004) | strategic actions frontiers for management education | |
| | Fagerberg et al. (2012) Dougherty (1999) Shumpeter (1934,1942) Goddard et al. (2012) Seggatto-Mendes and Mendes (2006) | meta-innovation innovation system innovative behavior creative destruction environmental change | generation of innovative knowledge |
| Entrepreneurship | Drucker (1985) Dutta and Crossan (2005) Lumpkin and Lichtenstein (2005) Clegg and Hardy (1999) Gibb (2002) Filion (1993,1999) Parker (1999) Short et al. (2010) | Uncertainty creativity vision, leadership entrepreneurial capacity opportunities intuition intraentrepreneur | capitalization of innovative knowledge |
| Creation Share Value | Porter e Kramer (2011) Anderson et al. (2009) Lovelock and Wirtz (2010) | value is the cornerstone redesign product and service redefine productive in the value chain develop local cluster | economic social and development of the territory |
| Economic and social development | Etzkowitz et al.(2012) Etzkowitz and Klofsten (2005) Feldman and Desrochers (2003) Harris (2001) Bathelt et al. (2010) Goddard et al.(2012) O'shea et al.(2007) Roberts and Eesley (2009) Urbano and Guerrero (2013) Shumpeter (1934; 1942) | Innovation networks science park accentuate working Relationships and collaboration new firms high performance innovation ecosystem | |

the actions of the university's administrative center to seek new sources of income and resources and fosters a culture of transformation of the internal processes at the institutional level.

A strengthened steering core of the university will combine the behavioral characteristics of the university's central leadership with the basic skills that are necessary to identify new opportunities, aiming to further the inclusion of the university in its surroundings. A strengthened steering core will encourage the university to adopt actions focused on a stronger integration with its environment, resulting in changes within the organization, empowering and encouraging the academic community to develop projects that target the problems and demands of the community beyond the campus.

Clark (1998) warns that the diversification of revenue sources will stimulate the debate about the substantial financial resources originating that are necessary to keep a university running. In public universities, the funding comes mostly from the government, while private universities sustain themselves mainly with the monthly tuition fees of its students. The entrepreneurial university adopts a strategy that will increase its portfolio of revenue sources, such as royalties from intellectual property, service provision to the industrial sector, service provision to local governments, among others. In Brazil, the funding model provides that federal, state or municipal governments make the financial resources available to maintain the operations of public universities (Silva, 2000). For private universities, on the other hand, tuition fees paid by its students represent a high percentage of revenues, reaching 100% for some of these institutions. The annual budget resources in public universities are limited, and private universities are also restricted by the revenues from tuition (Magalhães et al., 2010). This causes a fierce competition for resources between academic departments. With the diversification of revenue sources, by increasing the portfolio to consulting projects for companies and governments and by receiving donations from individuals and corporations, the university broadens its base of resources to invest in academic departments and to innovate administrative processes. The implementation of actions that diversify revenue implies the creation of a specific committee to design and implement a strategy to find resources (Marcovitch, 1979; Vieira and Vieira, 2003).

Clark points out that the entrepreneurial university encourages cooperative entrepreneurial projects that involve academic units or departments of the various areas of expertise and that are focused on the university's surroundings. These initiatives make room for the emergence of entrepreneurial attitudes in the heart of the academic community. The focus of the intervention projects should be closely aligned with the existing areas of expertise of the university. Projects between teachers and students from the most varying areas of expertise

should contribute to the spread of entrepreneurship across all areas of the university.

The norms of the entrepreneurial university

The framework of the entrepreneurial university developed by Etzkowitz (2001; 2004) rests on the concept of the triple helix and emphasizes innovation as one of the driving vectors of the relations between government-university-industry. Etzkowitz' analysis (2001; 2004) mentions that the combination of economic and social development has been incorporated into the new mission of the entrepreneurial university because of the transformation process in which the postmodern university is embedded: the so-called second academic revolution that began in the early 50s of the 20th century. His analysis also highlights that, until the 40s, education was the only mission of the university. The first academic revolution, in the early 50s, added research as a university's mission. These two missions, teaching and research, defined the university of the first revolution, while the combination of economic and social development has been incorporated into the new mission of the entrepreneurial university (Etzkowitz, 2001). The new mission of the university leads to the implementation of a set of internal actions in the university community, including the sensitization, awareness and involvement of professors, students and leaders in the discovery of new opportunities that are appearing to apply innovative scientific knowledge outside the university walls (Etzkowitz and Klofsten, 2005; Etzkowitz, 1998; Farsi et al., 2012).

Etzkowitz' entrepreneurial university framework (2004) is consists of five elements: capitalization, interdependence, independence, hybridization and reflexivity. All these elements are interconnected and integrated. The principle of capitalization consists in transforming innovative knowledge into an input, functioning as a catalyst and stimulating economic and social development. The notion of interdependence defines the new interaction models and formats, which imply very close ties with industry and government in order to foster innovation. Etzkowitz (1998) warns that the close relationship between university-industry-government should be guided by independence. That is, the entrepreneurial university should be an institution with its own decisions, mission, clear objectives and distinct governance. Hybridization refers to new formats and models of hybrid organizations that are emerging in universities as a result of the resolutions of tensions arising from the close relationships with industry and governments and from the relative independence, which must be kept in relation to other institutional spheres.

The new forms of relationships with industry and government drive innovation at the university and require

new organizational models and formats of the entrepreneurial university and new dialogue channels with the institutions of organized civil society (Clegg and Hardy, 1999). These new forms of relationship between university-industry-government create and capture economic, financial and social value by transforming the results of academic research into products, services, processes and innovative technologies. This contributes to the creation of new businesses, incubators and technological parks, and also transforms the economic and social scenario on a local, regional and national level (Etzkowitz, 2001; Clark, 2004).

A classification based on the literature of the entrepreneurial university

In his analysis, Rothaermel et. al. (2007) identified the exponential growth in the number of scientific articles on the entrepreneurial university from 2000 until 2005. He proposed a conceptual scheme, supported by four main fields of research and extracted from a review of the literature: (i) university research, (ii) productivity of the technology transfer center, (iii) creation of new businesses and (iv) an environmental context that includes networks of innovation. Rothaermel's et. al. (2007) analysis is interesting because it proposes a classification of the literature related to the entrepreneurial university. It connects and interfaces with internal and external aspects of the university and proposes a research agenda for the field.

Through these four components that makes up Rothaermel's et. al. (2007) scheme of the entrepreneurial university - university research, productivity of the technology transfer center, creation of new businesses and an environmental context that includes networks of innovation - we can observe aspects related to entrepreneurial activity. The first component corresponding to the entrepreneurial research university incorporates twelve key issues, ten of which are identified within the organization and linked to: incentives, status, location, culture, motivations and actions at the faculty, intermediary agents, policies, experiences, definition of roles and identities, experience and technology. The two key issues related to external factors are industry conditions and government policies. In the second component, involving the productivity of the technology transfer center, eight key issues were identified: technology, methods, systems, structure, faculty, personnel, university system and environmental factors. For the process of creating new companies, Rothaermel's et. al. (2007) research identified such key issues as technology, faculty, technology transfer center, owners and work teams of the new business, investors, relationship networks and external conditions. Finally, an environmental context that includes networks of innovation

implies the set of key issues that relate to the operation of the university in its external environment, such as networks of innovation, science and technology parks, incubators, the geographical location of actors and agents of the University.

Strategic actions of the entrepreneurial university

Kirby's (2006) concept of the entrepreneurial university is guided by a eight of eight strategic actions that seek to stimulate entrepreneurship: endorsement, incorporation, implementation, communication, encouragement and support, recognition and rewards, organization and promotion. These activities should lead to the creation of the entrepreneurial university. The strategic action of commitment means that the strategic leadership of the university should implement a model of an entrepreneurial organization. Incorporation is linked to performing internal and external activities encouraging entrepreneurship at all levels of the university. Implementation involves the development of an action plan and its monitoring across all levels of the organization, in cooperation with the people involved in the university. The strategic action of communication consists of publishing about and disseminating entrepreneurship. In Kirby's (2006) proposal, the university should offer material resources and a support infrastructure (entrepreneurship laboratories, pre-incubation, incubation, science and technology parks, environments for raising seed capital, and other mechanisms and instruments to support entrepreneurship) that stimulate an innovative environment. The strategic action of recognition and rewards implies the existence of programs and projects that encourage career development, an evolution of compensation and the sharing of equity. The strategic action of organization should implement interdisciplinary research activities, a multidisciplinary entrepreneurship center, educational partnerships and other mechanisms. Finally, the strategic action of promotion consists of entrepreneurial competition activities, highlighting business plan competitions and case studies.

Creating shared value (CSV)

Porter and Kramer (2011) discuss issues of competitive advantage, promoting a reflection on the relation between economic processes and the access to the corporate structure of organizations. The authors state that many organizations have incorporated the concept of CSV, but fail to understand its potential. This potential for CSV has three directions: a) the reconceptualization of products, services, processes and technologies (Lovelock and Wirtz, 2010; Anderson et al. 2009), b) a redefinition of productivity in the value chain, and c) the facilitation of the development of clusters in the university's vicinity.

This implies that it is necessary to look at decisions and opportunities through the lens of shared value, which supports innovative processes and adds value to society (Dutta and Crossan, 2005).

The authors are severely critical about the capitalist system, stating that in recent decades competitiveness has decreased in social and economic development. Capitalism still rests on a traditional approach that narrows the issues of value creation. This has resulted in an inability to optimize financial results and a lack of concern for customers' needs, in particular. According to the authors, organizations need to reconnect with business success and social progress. Shared value isn't just social responsibility, philanthropy, or sustainability, but a new formula for economic success. They believe that this path may lead to major changes in organizations. The conceptual proposal of CSV aims to substitute the dimension of corporate social responsibility (CSR), serving as an alternative guide to investments in communities. CSR has a stronger focus on the company image, but has a limited connection to its business (Carroll, 1979, 1999, 2001). CSV aims to offer added value and serves as a bridge to entrepreneurial opportunities

Conceptual metamodel proposal of the entrepreneurial university

After reviewing the literature on the four major frameworks of the entrepreneurial university, entrepreneurship, innovation and the creation of shared value, we intend to reflect in this section on the interfaces and connections between the main frameworks, seeking to identify the underlying conceptual dimensions. Table 2 presents the elements that were identified in the analysis of the texts and which served as support to outline the main conceptual frameworks on the entrepreneurial university, entrepreneurship, innovation, the creation of shared value and economic, social and cultural development, and also to identify the essential underlying aspects that contributed to establishing the dimensions of the metamodel.

The four main frameworks of the entrepreneurial university could be reconciled by a proposal based on the concept of CSV, which departs from the idea of configuring the business environment by providing opportunities to the actors involved in this business context. The dimensions that emerged from the analysis of the texts using the reflexive methodology and similar frameworks were used as reference.

The metamodel proposal of the entrepreneurial university synthesizes and expands our understanding of the entrepreneurial university and introduces aspects that are inherent of Brazilian universities. The metamodel, shown in Figure 1, consists of six dimensions:

entrepreneurial vision; committed strategic leadership; generation of innovative knowledge; capitalization of innovative knowledge; economic, social and cultural development of the region; and an integrated entrepreneurial culture.

Entrepreneurial vision

The notion of vision proposed in Filion's entrepreneurial metamodel (Filion, 1993, 1999) is based on the projection of an image of the future. The projected image can be any object, such a product, service, process or project and organization. The entrepreneurial vision must be clear and precise about the desired position and should provide a framework for how to get there. The entrepreneurial vision expands the possibilities of exploring business opportunities of a strong innovative nature (Filion, 1993, 1999). We adopted the concept of vision from Filion (1993, 1999) and Drucker (1985) to outline our entrepreneurial vision dimension. In our metamodel the entrepreneurial vision dimension is linked to the notions of projected image and mission. The image that is projected in the future is a university as an entrepreneurial organization that includes the paradigm of entrepreneurship (Gibb, 2002) in all its functions and operations. It promotes internal transformations and disruptions to adapt itself to the tensions arising from its environment and it seeks flexibility and efficiency through new structures of authority and ways of allocating resources. The concept of mission refers not only the teaching and research functions, but also to the university's role as an economic, social and cultural agent (Etzkowitz, 2001; 2004).

Committed strategic leadership

The dimension of a committed strategic leadership works as a kind of stimulating, propagating and strategic element of the transformational programs, projects and actions (Filion, 1993; Clark 2001). In the metamodel we propose for the entrepreneurial university, a committed strategic leadership dimension which refers to three concepts (Miller et al., 1999):

(i) Commitment to implementing the entrepreneurial vision, (ii) commitment to the pursuit of efficiency and flexibility at all levels of university, (iii) commitment to creating an institutional environment that stimulates entrepreneurial behavior (Etzkowitz, 1997).

Committed strategic leadership triggers a commitment to organizational innovation based on entrepreneurship across all levels of the organization. Its seeks to position the university at a level where it can respond with greater

agility and higher performance to the demands of the external environment, creating, capturing and sustaining shared value between the different actors in its vicinity (Vieira and Vieira, 2003; Marcovitch, 1979).

Generation of innovative knowledge

The entrepreneurial university should be strong in basic and applied research. It has to generate significant innovation, not just incremental innovation, but also disruptive. In addition, it should establish policies and strategies to stimulate research and development of an intensive, continuous and permanent nature (Poyagotheotoky et al., 2002; Feldman and Desrochers, 2003; Fagerberg et al., 2012; Martin, 2012). The generation of innovative knowledge dimension includes the notion that the generated knowledge must be used, both inside and outside the university (Ipiranga and Almeida, 2012). Inside, the knowledge should be used to improve the internal programs, projects and actions of the university by restructuring undergraduate and graduate programs, training entrepreneurial skills, introducing new teaching and learning strategies and reformulating curriculums, for example. Outside the university, innovative knowledge can be used to foster economic, social and cultural development generating benefits for the region through the creation of new companies, technology parks and the encouragement of innovative ecosystem (Roberts and Eesley, 2009; Seggato-Mendes and Mendes, 2006). The entrepreneurial university will only be an agent of economic and social transformation of its region if it can generate and apply innovative knowledge. This will require major investments in research and development.

Capitalization of Innovative knowledge

Capitalization of innovative knowledge is the transformation of an academic research result, that is, the innovative knowledge, into a financial, economic or social asset that is transferred to organizations (Moraes and Stal, 1994; Costa et al. 2010; Costa and Torkomian, 2008; Roberts and Eesley, 2009). Innovative knowledge can generate or modify products, processes, services and technologies, contributing, on one hand, to expanding the sources of revenue of the university and, on the other, to the economic, social and cultural development of the region.

In our proposed metamodel, the capitalization of knowledge involves three aspects: the protection of intellectual property, the technology transfer and environmental factors. The entrepreneurial university must develop strategies that protect technological products, processes, services and inventions against piracy, transferring the ownership of intellectual property

to the university and to the authors. The technology transfer raises questions about the need of having methods and techniques to select and assess patents with the potential of generating economic and financial resources that could be transferred to companies (Fagerberg et al., 2012). Another issue has to do with the mechanisms and instruments regulating the financial returns of licenses, a staff that is able to manage the transfer and internal systems with the programs and resources to support the transfer activity (Etzkowitz, 1998; Rothaermel et al., 2007).

The third aspect refers to an environment with the necessary economic and financial resources for industry and universities to establish a research and development agenda. University labs could share the research and development demands arising from local business activities. One of the ways in which Brazilian universities are expanding their revenue base is by realizing projects in conjunction with businesses, government and other sectors, and also by transferring technology through intellectual property (Marcovitch, 1979; Etzkowitz et al., 2000). These actions do not yet represent a significant percentage of the university's revenue, but they are signs of diversification.

Economic, social and cultural development of the territory

The entrepreneurial university understands value, creates value and delivers value for internal and external environments (Lovelock and Wirtz, 2010; Anderson et al., 2009; Porter and Kramer, 2011). The dimension of economic, social and cultural development of the territory isn't just the university's new mission, as described by Etzkowitz. It clarifies and highlights the new role that the university must play in response to the pressures and tensions from its environment. When considered from the perspective of CSV, the economic, social and cultural development dimension offers the analytical resources to interpret the relationship of the university with the other actors in its vicinity (Porter and Kramer, 2011). CSV is based on entrepreneurship and innovation that seeks to grab opportunities and to create, capture and sustain value, not only for the organization, but for the territory, driving economic, social and cultural development.

The economic, social and cultural development of the territory dimension gives rise to three notions: (i) creation of spheres of shared value, (ii) the internal and external operation of creating shared value, (iii) legal and ethical issues. The CSV can be created in the following spheres:

reconceptualization of products or services, where innovation is based on products, processes and services (Lovelock and Wirtz, 2010; Anderson et al. 2009); b) a redefinition of productivity within the value chain; and c)

enabling the development of clusters in its surrounding area (Porter and Kramer, 2011).

It is therefore necessary to look at decisions and opportunities through the lens of shared value in order to support innovative processes and added value. The internal operation refers to the three spheres that can create shared value within the university, enabling the reconceptualization of products, services, processes and redefining productivity in the value chain of the activities performed by the internal agents. The external operation refers to the value created within the university that is transferred to the external environment, developing clusters in the surrounding area (Schumpeter 1934; 1942; Aranha, 2007). The creation of businesses, technological parks and innovative ecosystem are some of the mechanisms and instruments that stimulate the economic, social and cultural development of the territory (Rothaermel et al., 2007). The ethical and legal aspects are linked to the set of elements that guide the conduct and behavior of the people who are in the internal environment of the entrepreneurial university (Conceição and Heitor, 1999; Harris, 2001; Kirby, 2006; O'Shea et al. 2007).

The entrepreneurial culture

The entrepreneurial culture dimension of the metamodel proposal for the entrepreneurial university represents three aspects. First, the importance of institutionalizing the instruments and mechanisms that increase the awareness and consciousness of people about the principles of entrepreneurship. The various attributes that define an entrepreneur pointed out by Dougherty (1999), Gibb (2002), Fillion (1993, 1999) and Schumpeter (1934:1942), indicate a skill set that distinguishes entrepreneurs from non-entrepreneurs.

Weltanschauung is an element of the entrepreneur metamodel (Fillion, 1993, 1999). It's a German word linked to the way we perceive the universe, or our worldview. *Weltanschauung* is closely related to an individual's framework of beliefs, ideas, values, emotions, and ethics, molding and defining his relationship with phenomena in the real world through his cognitive perceptions of them. This concept makes it easier to distinguish entrepreneurs from non-entrepreneurs. An individual may have a receptive or resistant *weltanschauung* to entrepreneurship. In the entrepreneurial university, the spread of entrepreneurship across all levels of the university -not just in academic fields, but also in departments that support its fundamental activities (teaching, research and extension) - is a permanent and continuous activity. It focuses mainly on raising awareness and educating individuals to transform their *weltanschauung* and establish connections with academic

and administrative practices.

The second aspect relates to programs, projects and training activities for entrepreneurial skills that are essential and necessary for entrepreneurial behavior. When the training involves undergraduate and graduate students, it focuses not only on creating new enterprises, but also on entrepreneurship and the university's support staff and professors, who are involved in the training to awaken the entrepreneurial skills of the intrapreneur (Gibb, 2002; Gibb et al., 2009). The third aspect refers to the establishment of incentive strategies and valuing entrepreneurial attitudes. This concept implies that the entrepreneur, student, researcher, teacher and technical and administrative support staff should be encouraged to adopt entrepreneurial attitudes within and outside the university.

Innovative contributions of the metamodel proposal

The analysis model offers proposal innovative contributions to the organizational analysis, especially in the research field of entrepreneurship and entrepreneurial universities. Framing the discussion so the metamodel proposal can be compared with other, existing models, clearly points to the innovative contributions of the proposal. We selected the four main frameworks of the entrepreneurial university: Clark's entrepreneurial pathways of university transformation (Clark 1998, 2004), Etzkowitz' (1998, 2004) norms of the entrepreneurial university, the classification of entrepreneurial universities based on Rothaermel's et al. (2007) bibliographic research and Kirby's (2006) strategic actions of the entrepreneurial university.

The four main frameworks describe the components of the entrepreneurial university, but neither highlights or performs an in-depth analysis of the relation of creating shared value and the entrepreneurial vision with the elements of the entrepreneurial university. This means the four main models are unable to demonstrate and emphasize:

the principles of creating shared value as a new approach that provides analytical resources to understand the relationships of the university and its stakeholders, in addition to its connections and associations with economic, social and cultural development, (ii) entrepreneurial vision as a fundamental element of the entrepreneurial university.

Entrepreneurial vision not only emphasizes the projection of an image that the entrepreneurial organization wants to achieve, but also the continuous and permanent nature of what it means to be an entrepreneurial university. Specifically, Clark's (1998; 2004) framework does not emphasize or develop an in-depth analysis of:

(i) the generation of innovative knowledge as essential attribute to ferment incremental or disruptive innovation of products, services, processes and technologies, (ii) the generation of innovative knowledge resulting from scientific research and the innovative transformations that contribute to a diversification of revenue sources, (iii) the generation of innovative knowledge and its links and connections to the capitalization of knowledge, (iv) the new function of the university as an agent of economic, social and cultural development.

The strong presence of the university in its surroundings mentioned by Clark is not sufficient to characterize the new function of the university. Etzkowitz' framework does not mention or analyze strategic leadership as an essential component of the entrepreneurial university. It also doesn't recognize that an entrepreneurial culture should be disseminated at all levels of the organization. Etzkowitz does reflect on the economic and social development of the region, but only regarding the university's mission. It is not included or highlighted in the six standards of the entrepreneurial university. Kirby's (2006) proposal does not analyze or highlight the generation of innovative knowledge, the capitalization of knowledge, economic and social development or the entrepreneurial culture as essential elements to understand the entrepreneurial university. He focuses on operational, rather than on strategic aspects. Rothaermel's framework does not perform an extended analysis of strategic leadership, economic and social development and entrepreneurial culture as essential elements of the entrepreneurial university, and also focuses on operational concepts, instead of on strategic ones. This restricts our understanding of the entrepreneurial university.

CONCLUSIONS

The absence of a metamodel of the entrepreneurial university that is capable of representing other existing representations, and of gathering and synthesizing all components that constitute and govern the entrepreneurial university, may limit our understanding of the underlying principles of the entrepreneurial university. The abstraction of a conceptual metamodel of the entrepreneurial university consisting of dimensions and supported not only by the major frameworks in the literature, but also by the CSV approach, could elevate and broaden our understanding of this phenomenon.

By proposing a discussion and reflection about the key frameworks of entrepreneurial universities, this article establishes the conditions for filling the gaps and contributes as follows:

(i) first, it unites the four main frameworks of the entrepreneurial university, which are dispersed and

fragmented in the literature, debating, reflecting and identifying the existing dimensions in order to contribute to the outline of a metamodel of the entrepreneurial university, (ii) second, based on the literature review, it cites the main conceptual frameworks of the entrepreneurial university and its conceptual connections with the creating shared value approach (iii) third, it proposes the most viable metamodel to synthesize, gather, delimit and expand our understanding of the main aspects that govern the entrepreneurial university; (iv) fourth, it indicates the evidence of the application of the viable metamodel in the entrepreneurial practices of Brazilian universities, (v) fifth, it presents a conceptual metamodel consisting of six dimensions - entrepreneurial vision, committed strategic leadership, generation of innovative knowledge, capitalization of innovative knowledge, economic, social and cultural development of the region, and an integrated entrepreneurial culture - which help to interpret and increase our understanding of the concept of the entrepreneurial university and (vi) sixth, the results advance the production of an interpretative conceptual model of the entrepreneurial university based on the four main frameworks and the principles of creating shared value, fields that are in need of further research in Administration and which were scattered and isolated in the Brazilian scientific production.

The dimensions identified from a reflection of the literature refer to a conceptual level and have restrictions and limitations, since research can uncover new dimensions. The challenge for future research consists in mapping the dimensions in the administrative and academic practices, seeking to observe the operation of these categories in the Brazilian university context.

Conflict of Interests

The author(s) have not declared any conflict of interests.

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