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MANAGEMENT AND INNOVATION IN LATIN AMERICA: INTRODUCTION

GESTÃO E INOVAÇÃO NA AMÉRICA LATINA: NOTAS DE INTRODUÇÃO

GESTIÓN E INNOVACIÓN EN AMÉRICA LATINA: INTRODUCCIÓN

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ABSTRACT

In this introduction to the special issue of Gestão & Regionalidade entitled "Management and Innovation in Latin America," we first review the published literature about the region, then introduce the ten new articles appearing in this issue, and finally reflect briefly on the current and future state of studies on innovation management and economics in the region. Latin America's innovation performance remains far short of its economic relevance, despite increasing academic research on the issue. Future research should highlight interactive ways to promote innovation, social innovations, public innovation, innovations for sustainability, technological innovations associated with the fourth industrial revolution, and the very specific nature of Latin American entrepreneurship.

Key words: innovation; entrepreneurship; management and economy of innovation; Latin America.

RESUMO

Nesta introdução à edição especial da revista Gestão & Regionalidade, intitulada "Gestão e Inovação na América Latina", primeiro elaboramos revisão da literatura sobre inovação na região, depois apresentamos os dez artigos que compõem esta edição, e por fim realizamos reflexão breve sobre o presente e o futuro dos estudos sobre economia e gestão da inovação na América Latina. O desempenho inovativo da região continua bastante aquém da sua relevância econômica, embora haja aumento da pesquisa acadêmica sobre a temática. Pesquisas futuras devem destacar as formas interativas de promover a inovação, as inovações sociais, a inovação pública, as inovações para a sustentabilidade, as inovações tecnológicas associadas à quarta revolução industrial, e a natureza muito específica do empreendedorismo latino-americano.

Palavras-chave: inovação; empreendedorismo; gestão e economia da inovação; América Latina.

RESUMEN

En esta introducción al número especial de Gestão & Regionalidade titulado "Gestión e innovación en América Latina", primero revisamos la literatura publicada en la región, luego presentamos los diez artículos que aparecen en este número y, finalmente, reflexionamos brevemente sobre el estado actual y futuro de los estudios sobre gestión y economía de la innovación en la región. El desempeño de la innovación en América Latina sigue siendo muy inferior a su relevancia económica, a pesar del aumento de la investigación académica sobre el tema. La investigación futura debería resaltar en las formas interactivas para promover la innovación, las innovaciones sociales, la innovación pública, las innovaciones para la sostenibilidad, las innovaciones tecnológicas asociadas con la cuarta revolución industrial y la naturaleza específica del espíritu empresarial latinoamericano.

Palabras Clave: innovación; emprendimiento; gestión y economía de la innovación; América Latina.

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Despite its still marginal role in global innovation, Latin America has witnessed an increase in intellectual output on innovation, reflecting the growing interest of universities, companies, and governments in enhancing the innovative performance of Latin American economies. In our introduction to this special issue of *Gestão & Regionalidade* we briefly survey this literature, selecting and reviewing articles from the main regional journals. We then present the 10 articles that form this special issue. Finally, we reflect on the challenges faced by future studies on innovation in the region, highlighting the importance of themes such as social innovation, public innovation, innovation for sustainability, the fourth industrial revolution, and the specificities of Latin American entrepreneurship.

1 A PANORAMA OF RECENT LITERATURE ON THE MANAGEMENT OF INNOVATION IN LATIN AMERICA

The pioneer in highlighting innovation in business environments was Schumpeter (1942), who concluded that it stemmed from company size and market concentration. Subsequent investigations, however, did not fully validate these factors (LAZZAROTTI; SAMIR DALFOVO; EMIL HOFFMANN, 2011). The OECD (2005) developed a set of guides for collecting and interpreting data on innovation, which has been very influential and has partly settled the discussion. Ahuya, Lampert, and Tandon (2008), in their meta-analysis, conclude that four factors determine technological innovation: industry structure, firm characteristics (like size, diversification, performance, and access to knowledge sources), intra-organizational attributes (like structure and processes, governance, and compensation), and institutional influences. Over the years the characteristics have been more specifically defined and types of innovation have been differentiated, with important regional implications.

In the introduction to an issue of Academia on innovation in Latin America, Ketelhöhn and Ogliastri (2013) analyze a database on Latin American patents registered between 1976 and 2012 in the United States Patent Office (USPTO). Their data show that Latin America accounts for 8.7% of the world's gross product but only 0.19% of patents. In patents per 100,000 inhabitants, Costa Rica and Uruguay stand out, with 7.05 and 4.72, respectively, between 1976 and 2012. Analyzing articles on innovation published in Academia (ARLA), the authors point out that the topic is eliciting growing interest among academics, companies, and governments, an interest that could enable the region to overcome historical barriers to innovation.

Developing countries, of course, differ greatly from advanced economies in their configurations of internal variables and their environments (ÁLVAREZ; URBANO, 2011a; ACS; AMORÓS, 2008). In a compilation of studies on entrepreneurship in Latin America, in the context of the Global Entrepreneurship Monitor GEM project, Amorós (2011) differentiates among economies based on factors of production (such as natural resources), those based on the efficiency of companies, and those based on innovation. Likewise, it raises the need to differentiate between enterprises undertaken merely for subsistence (as an alternative to unemployment) and those aimed at growth and even internationalization.

Álvarez and Urbano (2011b) analyze a decade of publications based on data from GEM in journals included in JCR (Journal Citation Reports, ISI / Clarivate). They identify the journals where the articles are published, the micro, meso, or macro level of the analysis, the most common statistical techniques, the countries covered, and the most cited authors.The authors conclude that, as a conceptual framework to understand entrepreneurship, the institutional approach (with formal factors such as government policies and support) is used more than the economic approach, which emphasizes environmental conditions.

In a historical review of Latin American thinking about innovation and development, Jasso, Del Valle and Núñez (2017) conclude that a school of thought exists that emphasizes structural heterogeneity, styles of development, authentic vs. spurious competitiveness, the Sábato Triangle, center-periphery relations, and policy strategies on science, technology, and innovation.

In general, innovation has been associated with entrepreneurship and resulting economic development and growth. Latin America is distinguished by high rates of entrepreneurship, but many of the enterprises are survival endeavors by people left without work, so the activity does not necessarily involve innovation or growth. Pino Soto (2018) studies the impact of innovation and internationalization on the competitiveness of exporting companies in South America. He finds such connection, and explains it by the building of new experiential knowledge about foreign markets in the firms, resulting in product/services innovations and growth.

A review of 128 research studies in Latin America (LÓPEZ; ÁLVAREZ, 2018) concludes that the four journals with the most publications between 2002 and 2018 are the *Journal of Technology Management and Innovation* (Chile), *Innovar* (Colombia), *Academia* (ARLA, international journal of CLADEA Association), and *Cuadernos de Administración* (Colombia). The authors are mainly from Brazil (78), Colombia (57), and Chile (46). 46% of the studies are quantitative. The authors analyze the individual determinants of entrepreneurship, environmental factors, international ventures, entrepreneurial orientation, eclectic approaches to entrepreneurship, and the financial factors that affect entrepreneurship. They note a need for more qualitative studies, and include in the reviews all the published literature, especially regional journals that are not included in international databases.

In the introduction to an issue of *Academia* aimed at identifying innovations beyond purely technological ones, Zawislak *et al*. (2017) outline a concept of innovation different from the traditional one, centered on managing the company or organization. The authors highlight the influence of the market, the surrounding community, and institutions, and indicate that governments and researchers should focus primarily on macroeconomic policy rather than microeconomic stimuli.

Tello Gamarra *et al*. (2018) carry out a bibliometric study of innovation studies by Latin American authors, based on data from Scopus and the Web of Science, covering 30 years (1987–2016). The authors conclude that such studies have increased significantly in recent years, as has collaboration of Latin American authors with others from the United States, Spain, and Great Britain. They also highlight the rise of research on innovation by Brazilian universities and authors. However, even in

academic research Latin America is lagging behind, as it contributes only 2.75% of the international bibliographic production on innovation.

For a sample of 74 high-performance businesses operating in knowledge-intensive business services industries (KIBS) as well as in industries that are less knowledge intensive, Lafuente *et al*. (2019) find that organizational characteristics significantly affect innovation performance, especially in KIBS firms. The results suggest that managers need to take into account the characteristics of business operations when they develop strategies aimed at enhancing organizational characteristics.

As the largest country and economy in Latin America, Brazil also leads innovation indicators,[1] although more in efforts than in performance.[2] Publications in Portuguese on the management or economy of innovation in Brazil have increased in recent years, if we take as reference the 123 scientific journals on administration and related areas in the SPELL (Scientific Periodicals Electronic Library) database. SPELL is an electronic library owned by the National Association of Graduate and Management Research (ANPAD, for its acronym in Portuguese). The number of articles in Portuguese with "innovation" in the title, summary, or key words rose from 106 in 2010 to 169 in 2012, 224 in 2014, and 239 in 2017 (SPELL, 2019).

In academic studies of innovation management, in the last five years, six journals stand out for their widely recognized quality. Two of them appear as specialized magazines: the *Revista de Administração e Inovação* (RAI) and *Revista Brasileira de Inovação* (RBI). Four others— *Revista de Administração de Empresas* (RAE), *Revista Brasileira de Gestão de Negócios* (RBGN), *Revista de Administração Contemporânea* (RAC), and *Brazilian Administration Review* (BAR)— are generalist journals publishing in all areas of management. From these journals we have selected six especially relevant articles: Gielfi *et al*. (2017), Lizarelli, Toledo, and Alliprandini (2019), Pereira *et al*. (2018), Perin *et al*. (2016), Silva *et al*. (2018), and Vasconcelos and Oliveira (2018).

Gielfi *at al*. (2017) analyze collaboration in research between the Brazilian state oil company, Petrobras, and several universities between 1980 and 2014. They find an increase in this collaboration and a strengthening of the Petrobras collaboration network with the entry of new universities. According to the authors, the brazilian government encourage such collaboration by large companies active in R&D and seeking new research-based skills.

Lizarelli, Toledo, and Alliprandini (2019) set out to identify whether companies use mechanisms to integrate exploitative innovation (developing existing products and processes) with exploration (prospecting for new products and processes). Integrating these activities—not just balancing them—can promote better results. The mechanism most used is interfunctional teams.

1 Brazil ranks 27th in domestic R&D spending as a percentage of GDP, according to the Global Innovation Index (GII) of 2018. This is the highest rank among the countries of Latin America. After Brazil come Argentina (51), Costa Rica (55), Mexico (61), Ecuador (65), Chile (70), Uruguay (71), Colombia (82), Guatemala (109), and Honduras (110) (CORNELL UNIVERSITY, INSEAD, WIPO, 2019).

2 According to the GII (2018), Brazil ranks no. 61 in the number of patent families registered by residents in at least two patent institutes. This is the third highest ranking among the countries of Latin America, behind Chile (46) and Uruguay (59). After Brazil come Mexico (66), Argentina (69), Costa Rica (71), Colombia (72), Honduras (90), Guatemala (99), and Ecuador (106). The GII (2018) ranks Brazil no. 35 in exports of high-technology products, as a percentage of total foreign trade. In this indicator also it is in third position in the region, behind Mexico (7) and Costa Rica (33). Following are Argentina (55), Guatemala (56), Colombia (57), Uruguay (61), Chile (68), Ecuador (75), and Honduras (82) (CORNELL UNIVERSITY, INSEAD, WIPO, 2019).

Pereira *et al*. (2018) examine collaborative networks linking institutions that registered biotechnology patents—medicines from plants—whose inventions had Brazil as their main country. Public universities and public research support agencies are the main drivers of innovation in Brazil, and their actions are reflected in the largest number of patent registrations, as well as in the interactions they establish. Brazilian participation in innovation in biotechnology remains low. The study highlights the urgent need to form alliances with foreign companies to create consistent technological solutions in projects developed in Brazil.

Perin *et al*. (2016) raise two research questions: does the development of open-mindedness in emerging markets drive the creation and improvement of social networks? and does the improvement of social networks generate radical innovations and better performances? Investigating 324 Brazilian companies in the industrial sector, the authors find that open mindedness (receptivity to new ideas) makes executives more willing to cooperate in internal and external networks, generating radical innovations. The effects of the open mentality on the internal social network are mediated by the external social network, suggesting that the open spirit is an important antecedent of the conversion of external social capital into internal social capital. External social networks influence the existence of radical innovations not directly but through internal social networks. Financial performance is positively influenced by external social networks and also by radical innovations.

Silva *et al*. (2018) analyze the commonalities and differences among three kinds of agents that support the development of technology-based companies (EBT in Portuguese). The authors perform a qualitative study of twenty-three innovation support agents, distributed among business accelerators, business incubators, and technology parks located in Brazil or Portugal. The main results can be summarized as follows: technology parks have more developed physical structures, more suited to innovation, than accelerators or incubators, which usually have barely adapted physical spaces. The accelerators and incubators support the development of the EBT through the transfer of physical infrastructure, management training, product design, formation of social capital, and fundraising, though the range of services offered varies among agents. The accelerators and incubators have an important role in shaping the strategic vision of the EBT, which can be a determining factor in their success. The existence of EBT capabilities that complement those of the innovation support agent predisposes companies to form internal alliances to meet market demands; the support agents facilitate social relations between the EBT and agents of the innovation environment, especially universities.

Using a quantitative approach, Vasconcelos and Oliveira (2018) seek to identify the managerial factors that favor innovation in 315 micro and small companies in the state of Pernambuco (Brazil). Their results indicate that innovative capacity is associated not only with the entrepreneur and strategic management, but also with the information obtained through knowledge networks and relationships with clients and society.

We must emphasize that the referred journals disseminate research that does not only focus on the management of innovation in Brazil, but also

in other Latin American countries such as Colombia (MARÍN IDÁRRAGA; CUARTAS MARÍN, 2019).

All these articles highlight the importance of social networks, internal and external, in promoting innovation. Also important are collaboration between companies and universities, knowledge networks, and interaction with customers and society in general. The authors also emphasize the prominent role of universities and public support agencies for research in frontier sectors in Brazil, as well as the limited participation of foreign capital. What we emphasize is the fundamental association of innovation with social networks, with collaboration, with the exchange of knowledge, with cooperation, with various forms of external and internal interaction, through the market or not.

2 THIS SPECIAL ISSUE OF GESTÃO & REGIONALIDADE

Latin American countries face a challenge: increasing their participation in the global effort to create new products and processes. There is also need for the scientific community to elucidate, disseminate, and record innovations, as well as the process of innovation itself, in order to give tools to public policy and improve the management of business innovation. Two years ago, *Gestão & Regionalidade* called on the Latin American academic community to reflect on the challenges of managing innovation. The result is this issue, comprising ten research articles selected through double-blind arbitration.

Sosa-Sacio and Matos-Reyes (2019) evaluate the reliability and validity of a survey of Peruvian SMEs, comparing it theoretically and empirically with another conducted in Brazil in the same business segment (by Tidd, Bessant, and Pavitt, 2005). They argue that an organization's "innovative capacity" results from exploring and exploiting new business opportunities, adopting innovative technologies, generating new ideas, developing proposals, and taking risks. Innovative capacity influences creative performance, defined as the creation of ideas and innovative solutions to address business challenges effectively and efficiently. They therefore measure innovative capacity by the generation of value in the market, rather than by antecedents such as creativity and invention (ANDERSON; POTOCNIK; ZHOU, 2014).

Pastor Pérez, Rodríguez Gutiérrez and Balbinot (2019) study the dynamic capabilities of small and medium-sized enterprises. Dynamic capacities (TEECE; PISANO; SHUEN, 1997) are those that allow a company to evolve and manage changes in its environment, to maintain competitive advantage. The authors randomly sample 330 companies operating in the Latin American market and conclude that there is a relationship among entrepreneurial orientation, market orientation, and the dynamic capabilities of small and medium enterprises.

Vásquez-Rodríguez (2019) investigates how small and medium-sized companies in the printing/graphic sector face the need for technological innovation in production. Studying this sector within Colombia, the author analyzes moves from adoption to adaptation and from there to creation, but without venturing into the risky international technological frontier (MALAVER; VARGAS, 2004). The 43 semi-structured interviews and exhibits show how companies interact with their environment and make decisions to update. The author

recommends strengthening access to information for small entrepreneurs, looking for more types or options of association, taking advantage of the opportunities of the "orange" economy, and achieving a joint agenda for disseminating technologies and innovations throughout the industry.

Sarate and Piccinini (2019) investigate the relationship between collective entrepreneurial actions and social innovation, with a focus on transformations in the way social actors live. They investigate the tourist route "Caminhos de Pedras," in the municipality of Bento Gonçalves, Rio Grande do Sul (Brazil). The creation of this route affected the process of territorialization, generating alternative ways of inhabiting: it enhanced the local culture but also somewhat eroded community ties of reciprocity (solidarity and cooperation).

Lacerda and Machado (2019) analyze how innovations in consumer products have been developed at the base of the pyramid in Brazil, through three qualitative case studies. They argue that the innovation strategies predominating in the three companies studied are based on the market (understanding customers to identify how to satisfy their needs) and on exploitation (using existing knowledge and learning to reconfigure their products).

Calíope and Silva Filho (2019) analyze innovation in fashion companies at the José Avelino Fair (Fortaleza, Ceará, Brazil). Their qualitative study reveals that even in a chaotic environment full of problems such as this fair, there is innovation. However, the innovations in apparel products are only incremental, with small variations in styles, fabrics, and accessories based on imitating models from the media, the internet, soap operas, and street stores and shopping centers. There is, according to the authors, a kind of reinterpretation of the models through copying, with adaptation to the environment of the fair's participants.

Santos and Peixoto (2019) investigate obstacles to the consolidation of an entrepreneurship ecosystem in Rio de Janeiro. The authors interviewed twenty entrepreneurs, investors, venture capitalists, public sector representatives, academics, and representatives of support institutions such as incubators, accelerators, and associations. The results indicate that the city's entrepreneurial ecosystem is in the early stages of development and faces challenges in three spheres: personal (lack of collaboration as well as ego disputes); organizational (absence of effective organization, management, and planning); and in relation to density (initiatives concentraded on few actors and lack of connection and articulation). Macro obstacles include legal issues of national scope, such as corporate, labor, and fiscal issues; micro obstacles are related to the City of Rio de Janeiro's lack of effective public safety, adequate urban mobility, and efficient infrastructure. The interviewees' improvement proposals focused on planning and integrating initiatives, creating spaces for innovation and collaboration, and events relevant to entrepreneurship.

Saraiva *et al*. (2019) seek to identify and analyze strategies that contribute to making cities intelligent through the use of information and communication technologies (ICTs). Their case study of Curitiba (Paraná, Brazil) shows that its actions related to the democratization of information, urban mobility, green areas, and waste management can serve as models for other cities in Latin America that intend to become intelligent.

Santos and Paganotti (2019) describe the process of innovation in the Brazilian automobile industry in the region of Grande ABC. In a qualitative multiple case study between September 2012 and May 2014, the authors interviewed 26 professionals from the sector. The authors identify the innovation model of the local automotive chain as an adaptation involving R&D activities from parent company, benchmarking with competitors, local R&D contributions, and a modest contribution from the local research institutes. Although local automakers adopted a global structure when building vehicles, they also studied the Brazilian and South American markets.

Pamplona and Silva (2019) explore academic research on the "state of the art" of precision agriculture (PA) in South America. They focus on three countries representative of the region's economic and edaphoclimatic conditions: Argentina, Brazil, and Colombia. They find that Brazil seems to be more advanced, in the sense that it has a set of organizations that can act as a network fostering the adoption of PA technologies to sustainably intensify production in the field. Colombia, less advanced, needs to establish and connect such organizations. In an intermediate position is Argentina, where there are already a relatively organized and active structure and a considerable level of adoption in certain regions.

3 WHAT IS THE FUTURE OF RESEARCH ON INNOVATION MANAGEMENT IN LATIN AMERICA?

Despite the progress that this special issue demonstrates in research on innovation, management, and organizations in Latin America, there remain emerging issues of special interest for future researchers in both the private and the public sectors: social innovation, public innovation, innovation for sustainability, and the fourth industrial revolution.

Among the various types of innovation, in Latin America there has been much interest in social innovation, probably because of the region's great needs and social inequalities. Defined as innovation aimed at creating social value, not necessarily value for shareholders (OGLIASTRI *et al*., 2015), social innovation has been studied particularly through successful cases (see, for example, those of the SEKN project of the Harvard Business School). Austin *et al*. (2007) observe a tendency towards congruence between the management of social enterprises and that of private companies. However, Lopes *et al*. (2017) conclude that social and managerial innovation differ substantially, especially in the processes of generation and dissemination. This debate calls for further investigation.

The management of innovation in public organizations will require more research in Latin America in the future. The last thirty years have involved multiple reforms of public administrations, and innovation has played a decisive role in that change (BASON, 2018). The New Public Management (NPM), which promoted innovations both in the provision of public services and in the operation of the state, was based on both incremental and disruptive changes in organizational processes (DIEFENBACH, 2009), and has encountered both limitations and criticism. There is also an emerging international literature on public organizations in sectors such as

defense, public health, and finance t hat h ave implemented innovations vital to the business ecosystem (MAZZUCATO, 2016; MAZZUCATO; SEMIENIUK, 2017), and these topics are still to be investigated thoroughly in the region. Finally, the trend toward generating public value attempts to transcend the NPM's narrowly economic perspective on the role of public organizations, focusing more broadly on articulating and integrating state ends, citizen interests, business dynamism, and collective values, for which public and social innovation must converge (BENINGTON; MOORE, 2011; BRYSON; CROSBY; BLOOMBERG, 2014).

Innovation for sustainability involves a convergence of public policies, organizational management, citizen action, and top-level academic research (SCHALTEGGER; WAGNER, 2011; SILVESTRE; ŢÎRCĂ, 2019). The UN Sustainable Development Goals seek the adoption of measures to end poverty, protect the planet, and ensure that all peo-ple enjoy peace and prosperity (UNITED NATIONS, 2015). The weak progress toward the Millennium Development Goals, as well as multiple planetary social, environmental, and economic crises, chal-lenge business processes to promote technological, social, and organizational innovation (UNITED NA-TIONS, 2015). Among organizational management issues of particular interest for Latin America are ecological footprint, the circular economy, and the changing energy matrix, owing to the region's eco-systemic biodiversity, high indexes of inequity, and historically extractive economy.

Although, as we have previously indicat-ed, Latin America's level of business innovation is low, it is already being affected by the fourth industrial revolution, 4IR, due to the acceleration of technological change and its penetration in industries, organizations, professions and occupations (JOYANES, 2018). The 4IR implies the interconnection of processes, machines, information and people. This convergence of digital, biological, and physical innovations is transforming the patterns of production, consumption, and social relations (SCHWAB, 2016) in ways that are both heterogeneous and asymmetrical. As this revolution progresses, weaknesses in innovation ecosystems in Latin America could widen current innovation gaps, with profound economic and social impacts. All of this opens multiple fronts of reflection, action, and research in management of innovation.

Finally, we ask ourselves: Do entrepreneurs really produce growth? Although Latin America has many entrepreneurs, most of them start businesses out of necessity rather than to capitalize on an innovation opportunity. These "entrepreneurs for survival" are not negative for a country, but tend to be temporary. Their businesses do not create significant added value, nor do they contribute significantly to growth (DE SOTO, 1988; VALLIERE; PETERSON, 2009). Levels of development also limit innovation. Some countries (such as Guatemala or Venezuela) have economies based purely on the extraction of natural resources, and some have advanced towards economies based on efficiency and large companies (such as Argentina, Brazil, Chile, Colombia, Ecuador, Mexico, Panama, and Peru). However, no country in Latin America has reached the third stage of business development, based on innovation, where entrepreneurship activities fit better and result in growth (AMORÓS, 2011; OGLIASTRI, 2011).

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