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Rankings and entrepreneurial higher education

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This literature review provides readers with a synthesis of current information about university rankings, including those related to academic entrepreneurship, which serve as a means of monitoring third mission efforts in Higher Education Institutions (HEIs). By conducting a thorough search on Scopus and Web of Science databases, relevant studies were selected based on specific criteria. The review suggests that rankings directly impact the governance of HEIs. Due to the disparate nature of third mission university activities, having a ranking system for universities based on these specific types of activities could provide government policymakers with a greater understanding of the strengths of universities across a new range of metrics. The findings highlight that there is still no common framework of criteria for evaluating and measuring the performance of entrepreneurial universities and the engagement of academics with third mission activities. Addressing this issue is crucial because entrepreneurial education alone does not significantly influence students' intentions to pursue entrepreneurship and start new businesses. By creating incubators and providing financial resources, consultancy and access to technological tools, universities encourage and support their students' entrepreneurial intentions, diversify their funding sources and enhance their innovation and profitability. Academic entrepreneurship rankings can help universities develop appropriate institutional settings to achieve these goals and to produce individuals capable of leading social and economic progress.

KEYWORDS

higher education, university, rankings, academic entrepreneurship, entrepreneurial universities

1 Introduction

Higher education is an essential component of a productive economy, so that aspects such as excellence in teaching and learning; research and academic productivity; creation and transfer of knowledge; employability of graduates; among others, have become indicative of a country's ability to compete globally (Hazelkorn, 2013). Higher education must become a strategic factor for economic development, for improving the well-being of citizens and for guaranteeing national interests, since it is one of the indicators that significantly affects a country's competitiveness index in the Global Competitiveness Report, carried out annually by the World Economic Forum since 2004 (Bazhenkov et al., 2023).

Similarly, entrepreneurship is an important driver, essential for stimulating economic activity and development. Baliyan et al. (2020) identified that entrepreneurship results in a country's economic growth, employability and income generation, and improves individual and social growth. Furthermore, the authors state that the rapid growth of entrepreneurship globally is attributed to the power of education in promoting the socioeconomic well-being of individuals and countries.

Higher Education Institutions (HEIs) play an important role in providing education and training for potential entrepreneurs (Farashah, 2013; Lanero et al., 2011) and are expected to produce individuals capable of leading social and economic progress (Barba-Sanchez and Atienza-Sahuquillo, 2018). This aligns with the fourth Sustainable Development Goal (SDG) of the United Nations (UN)—Quality Education (ONU—Organização das Nações Unidas, 2024), through the development of social skills in students. Each country chooses its vision of the directions for the development of education that are relevant to it, and the perspectives for its implementation (Dvoretzskaya et al., 2023). In 2015, the SDGs were agreed upon by the 193 UN member states, but their success also depends on actions and collaboration from other sectors, such as businesses and civil society (BNDES—Banco Nacional de Desenvolvimento Econômico e Social, 2019).

To accelerate the development of entrepreneurs, universities worldwide have started to develop entrepreneurial education programs. These programs involve activities such as active learning and problem-based learning, with the following purposes: (i) to focus on the competencies, knowledge, skills and abilities necessary for students to pursue entrepreneurship; and (ii) to offer a new worldview that incorporates entrepreneurial thinking, passion, autonomy and instrumentality, which can be applied in all dimensions of their personal and professional spheres (Llorente-Portillo et al., 2024).

The governance of HEIs is directly impacted by rankings, which generate intra- and extra-institutional pressures for educational quality (Calderón et al., 2019) and influence the decision-making of these institutions, both in terms of their internal agents and their relationship with the outside world (Fanelli and de Carranza, 2018). Stack (2021) states that the impact of university ranking systems goes far beyond the campus as, for many institutions, ignoring their ranking means becoming invisible.

According to Calderón et al. (2019), whose study focused on Portuguese-speaking higher education, university rankings have been the object of demands not only from social segments linked to innovation and technology, but also from governments such as Angola, Cape Verde, Macao, Mozambique, Portugal and Brazil. Besides that, China created the C9 League and injected 1.86 billion dollars to compete with the American universities in the Ivy League (i.e., Brown, Columbia, Cornell, Dartmouth, Harvard, Pennsylvania, Princeton and Yale). Russia allocates 152 million dollars per student to study at a university ranked in the top 200 worldwide. India has partnerships for joint degree programs only with universities in the top 500 (Taylor et al., 2014).

This is consistent with what was presented by Bazhenkov et al. (2023), which states that the concept of competitiveness is intertwined with the evaluation of HEIs in national and international rankings. Rankings are considered a way to monitor and assess the competitiveness of these institutions.

2 Literature review

The researchers conducted a literature review using the Scopus and Web of Science databases to investigate the concepts and developments regarding university ranking systems, with an emphasis on entrepreneurial higher education. The search employed keywords such as “University Rankings,” “Academic Rankings,” “Entrepreneurial

Universities,” “Entrepreneurship” and “Higher Education” along with combinations and variations of these terms.

2.1 University ranking systems

The first international rankings for academic evaluation emerged in the 2000s (Calderón and França, 2018), with the aim of identifying ‘world-class’ academic institutions. Bazhenkov et al. (2023) note that the classifications derived from the rankings are characterized by different target audiences (the main consumers of that information), the method used to obtain results and the evaluation methodology.

The main objective of a ranking is to evaluate the position of the HEI as a whole and its achievements in the areas in which it operates, to prevent the dispersion of resources and the inefficient use of human capital (Bazhenkov et al., 2023). In this scenario, university rankings can be considered from different perspectives (Hazelkorn, 2013):

- For students, they indicate the monetary potential or the benefits that the university can provide in relation to their future profession and salary;
- For stakeholders, they signal the quality of the educational product and the revenue benefits brought in by the students;
- For employers, they indicate what can be expected of graduates from a particular HEI;
- For those responsible for formulating government public policies, they suggest the level of quality and international standards, as well as their impact on national economic capacity and ability;
- For HEIs, they provide the means to compare their performance;
- For the public, they provide valuable information on the performance and productivity of HEIs in a simple and easy-to-understand way.

Hazelkorn (2013) states that university rankings measure bio and medical sciences research; publications in Nature and Science; student and faculty characteristics (e.g., productivity, entry criteria, faculty/student ratio); internationalization; and reputation amongst peers, employers and students. On the other hand, they do not measure teaching and learning (including “added value”); the impact of research on teaching; Arts, Humanities and Social Science research; technology/knowledge transfer or the impact and benefit of research; regional or civic engagement; and the student experience.

The central role played by university rankings is highlighted in the following studies:

- Influence on students’ choice of university (Challenge Success, 2018) and, consequently, which universities benefit from the revenue they bring in (Lynch, 2014);
- Repercussions in the trade (Cantwell, 2016) and regional economic growth (Kochetkov et al., 2017);
- They are reflected in tuition fees and, in some cases, even in the salaries of university rectors (Yeung et al., 2019);
- Impact on immigration policies (Ordorika and Lloyd, 2013): the number of young people traveling abroad to study has increased by around 50% since 2000 (Lynch, 2014);
- They interfere with the flow of postgraduate students, the hiring of professors and philanthropic and financial support (Badat, 2010).

Supplementary Table 1 briefly describes the major university rankings, in chronological order of their creation.

Often referred to as the “Big Three,” the Academic Ranking of World Universities (ARWU, also known as Shanghai Ranking), Times Higher Education World University Ranking (THEWUR) and Quacquarelli Symonds (QS) Top University Rankings are commonly cited by university leaders, industry and government policy makers. The “Big Three” offer several derivative products, including regional rankings, consulting services and software designed to help university leaders hire and make other decisions that can improve an institution’s ranking (Hazelkorn, 2015).

According to Bazhenkov et al. (2023), the popularity of rankings in the media and the attention of public opinion to their indicators contribute to the fact that universities in the top rankings are perceived by society as more suitable institutions, because they align themselves with modern and progressive trends. The authors say that global rankings are mainly geared towards evaluating the scientific vector, while national rankings usually evaluate the educational function.

Stack (2021) points out that the influence of the American model on international ranking methodologies is undeniable. The systems favor indicators that are characteristic of or even unique to the United States context, such as the number of publications in English-language journals or the level of patent production by universities. This favors not only English speakers, but also researchers in hard sciences, since most journals are in these areas. For example, in Scopus database—which is consulted by almost all the major rankings—49% of citations come from publications in life sciences and medicine, followed by natural sciences with 27%, and engineering and technology with 17%. By contrast, social sciences and humanities account for only 6 and 1% of citations, respectively.

As a result, many governments, including Brazil, have prioritized programs in the STEM areas (Science, Technology, Engineering and Mathematics), whose results are more visible on a global scale. Between 2012 and 2017, the Brazilian government invested more than 3.5 billion dollars to send more than 100,000 STEM students to study at top-ranked universities (mostly in the United States) (Caldeira, 2017). Meanwhile, in Japan, in 2015, 26 universities (out of 60) announced plans to close or reduce their faculties of social sciences and humanities, on the grounds that there were areas that could better meet society’s needs (Grove, 2015).

According to Stack (2021), highly ranked HEIs tend to attract international scholars, an indicator reflected in QS and THE rankings. The same applies to government funding strategies, as the best-placed universities in the rankings are the ones that receive the investment to improve their positions. This results in the rules of the game favoring previous winners, increasing their power and prestige, something sociology calls the Matthew Effect: those who start with an advantage accumulate more advantage over time.

Rankings have introduced new, external measures of academic hierarchy. This shift has profound implications, including a loss of autonomy for individual institutions and higher education systems and a trend towards the homogenization of priorities and goals at the expense of locally determined agendas. By adopting the criteria and results of the rankings, HEIs and government policymakers are legitimizing these rankings and consolidating the higher education model (Stack, 2021).

When focusing on cutting-edge scientific achievements, rankings are unable to characterize the depth of an institution’s teaching function. Therefore, given the limitations brought by the methodological principles, characteristics and target audience of each ranking, one should not overestimate the possibilities of evaluating university’s competitiveness through these rankings (Bazhenkov et al., 2023). Sponsler (2009) also considers that university rankings should not be used as the sole criterion in the construction of public policies, but rather as one of the means for institutional evaluation.

2.2 Academic entrepreneurship rankings

Entrepreneurship is a multifaceted effort influenced by demographic, social, cultural, economic and environmental factors (Arranz et al., 2019). Gender, level of education, parents’ profession and family income, for example, can be determinants of entrepreneurial intention. Therefore, entrepreneurial attitudes vary from one individual to another depending on the factors that influence their career, whether they stem from past experiences or external persuasive communication (Baliyan et al., 2020).

Entrepreneurial universities are a phenomenon resulting from university’s transition from being a conservator of knowledge to a creator of knowledge (Farrell et al., 2024). However, they are not restricted to innovation and entrepreneurship but also include direct and indirect academic engagement with their immediate environment, with actions such as science communication and policy development, which demonstrate social responsibility towards their community (Philpott et al., 2011). Academic entrepreneurship has been considered an intellectual initiative in which universities cooperate with society for economic and social value (Beckman and Cherwitz, 2009).

The third mission of universities concerns their interactions with the rest of society and third mission activities are those mainly directed towards the generation, use, application and exploitation—outside academic environments—of the university’s knowledge and other capabilities (Molas-Gallart et al., 2002). Such activities inherent to the third mission are also known as knowledge transfer activities or entrepreneurial activities (Fuller and Pickernell, 2018).

The Knowledge Spillover Theory highlights that knowledge created by universities can spill over indirectly into the economy to be exploited by entrepreneurs. This dissemination of university knowledge is the key to the role of these institutions within the triple helix—a theoretical framework that brings together universities, government and industry (Fuller et al., 2019).

A university is called entrepreneurial when it “embraces its role within the triple helix model and adopts the third mission of contributing to regional/national development” (Philpott et al., 2011), in addition to its traditional teaching and research missions (Fuller and Pickernell, 2018).

The development of entrepreneurial education programs has evolved over the past eight decades, beginning in 1947 at Harvard University (United States), focusing on cultivating an entrepreneurial mindset among students, and during the mid-1970s at the University of Southern California (United States) and Babson College (United States). From the late 1980s, these programs expanded worldwide, shifting the focus from teaching students to become entrepreneurs to understanding entrepreneurship in the context of

small business management. In the late 1990s, the focus shifted again, this time to stimulating the development of creative thinking and innovative problem-solving skills, which could be applied in a corporate context to make these students more desirable employees (Llorente-Portillo et al., 2024). Nowadays the focus of entrepreneurial education programs is to provide students with the knowledge and skills necessary to establish cutting-edge, scalable ventures based on innovative technological ideas (Kuratko and Morris, 2019).

According to Dvoretzskaya et al. (2023), an entrepreneurial university aims to achieve the greatest possible financial independence from the state and maximize effectiveness in its educational and scientific activities, while striving to minimize risks. A key characteristic, therefore, is the proportion of its income derived from non-governmental sources. An academic as an entrepreneur is the main agent in achieving the university's third mission (Llorente-Portillo et al., 2024), by incorporating commercialization activities, which allow diverse sources of funding and enable the university to increase its innovation and profitability (Karlsdottir et al., 2023).

Fuller et al. (2019) point out that, due to the disparate nature of third mission university activities, having a ranking system for universities based on these specific types of activities could provide government policymakers with a greater understanding of the strengths of universities across a new range of metrics.

Supplementary Table 2 briefly describes the major academic entrepreneurship rankings, in chronological order of their creation.

Bazhenkov et al. (2023) state that global rankings of the scientific and educational activities of HEIs evaluate the quality of students' career preparation and are an indicator of the implementation of entrepreneurial and international university activities. Karlsdottir et al. (2023) point out that there is still no common framework of criteria for evaluating and measuring the performance of entrepreneurial universities and the engagement of academics with third mission activities.

According to Karlsdottir et al. (2023), gaining a better understanding of third mission activities does not facilitate the creation of an entrepreneurial university structure but assists in "building a powerful and dynamic research environment in regional innovation systems, through the premeditated allocation of funds, the creation of appropriate organizational structures and incentives, and the development of policies." The results of the work by those authors indicated that the engagement of academics in soft third mission activities, such as community activities and external training and teaching, can be better predicted by individual factors, like gender; age; work experience outside academia; openness to experimentation. Whereas the engagement of academics in hard third mission activities, such as applied contract research and commercialization, is better predicted by organizational factors, like the size of the university or its departments; type of university (private or public); age of the university; whether it is more or less research-oriented; whether the funding is academic or governmental; location of the university; number of disciplines in health and STEM areas (Karlsdottir et al., 2023).

Farrell et al. (2024) studied academic entrepreneurship particularly in middle- and low-income countries and identified that collaboration with industry (external partners and institutions) is a more relevant path for academic entrepreneurship in these countries, compared to high-income countries, where intellectual property licensing and royalties are the main activities.

Literature suggests that entrepreneurial education alone does not impact students' intentions to undertake entrepreneurship and create new businesses (Llorente-Portillo et al., 2024). According to Rocha et al. (2021), appropriate institutional settings in HEIs can foster entrepreneurial cultures, benefiting students through education, idea development and business assistance (Shi et al., 2019). By creating incubators and providing financial resources, consultancy and access to technological tools, these institutions encourage and support their students' entrepreneurial intentions (Choi et al., 2017).

3 Discussion

Since their emergence in the 2000s, university ranking methodologies have been updated, resulting in significant improvements. Rankings are now available by subject and region, making them a popular tool among researchers, university administrators, professionals engaged in collaborative activities and policymakers for evaluating and comparing HEIs. The increasing importance of academic entrepreneurship as a key driver of innovative progress and regional economic development has led to the expansion of this research field and the creation of new metrics.

By analysing Supplementary Table 1, we can observe that several university rankings have made efforts to assess aspects of the third mission, such as the following pillars: "Industry" in THE Global Rankings; "Institutional Collaboration" in Leiden Ranking; "Innovation" in SIR; and "Knowledge Transfer" and "Regional Engagement" in U-Multirank. Nevertheless, some gaps remain. Their primary focus is on evaluating scientific achievements globally, rather than emphasizing national educational and economic aspects or addressing local priorities and goals.

By analysing Supplementary Table 2, we can observe similarities between academic entrepreneurship rankings. Common aspects include intellectual property, scholarships and grants, research, institutional infrastructure and ecosystem. This observation suggests that academic entrepreneurship rankings are based on three interconnect clusters: (i) Academic and Research Activities; (ii) Institutional and Structural Components; and (iii) Knowledge Transfer and Economic Impacts.

The reason these rankings may fail to fully capture universities' academic entrepreneurship efforts is the need for a deeper understanding of the expanded roles of universities as catalysts for regional economic and social development. This involves the exploration and exploitation of entrepreneurial opportunities, within a multilayered ecosystem that includes actors at the individual, organizational and institutional levels.

Existing academic entrepreneurship rankings could be enhanced by assessing interlinkages of under-explored determinants of academic entrepreneurship, such as the processes involved in diversifying funding sources and developing strategies, structures and incentives. Additionally, it is equally important to explore the characteristics of academic entrepreneurs, their motivations and barriers in technology/research commercialization, and the mechanisms and components that foster their entrepreneurial identities as they engage in the entrepreneurial process.

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Conflict of interest

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Supplementary material

The Supplementary material for this article can be found online at: <https://www.frontiersin.org/articles/10.3389/feduc.2025.1562664/full#supplementary-material>

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