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University management perspectives: A systematic literature review through bibliometrix

Perspectivas sobre gestión universitaria: Una revisión sistemática de literatura a través de bibliometrix

Andrea Mosquera-Guerrero[1]

Edward Enrique Escobar-Quiñonez[2]

Universidad Cooperativa de Colombia

Resumen

La universidad es un actor clave en la creación de conocimiento que debe acoger las demandas de los diferentes grupos de interés que demandan respuestas pertinentes y acordes con las tendencias globales; es así que su gestión con el paso del tiempo se ha convertido en una actividad compleja. Con base en lo anterior, se presenta este trabajo, que tiene como objetivo dar a conocer tendencias en la gestión universitaria a través de la revisión de las bases de datos Web of Science y Scopus. Los registros obtenidos se analizaron utilizando teoría de grafos y herramientas como Bibliometrix. Los resultados permitieron identificar cuatro perspectivas: a. transferencia de tecnología y emprendimiento universitario; b. modelo educativo; c. gestión del cambio en instituciones académicas y d. grupos de interés. A través de un análisis de redes se determinó que los autores más relevantes son Henry Etzkowitz, Mario Raposo y G.E. Zborovsky. Por su parte, la región con mayor producción en el

1 Universidad Cooperativa de Colombia, Facultad de Ciencias Administrativas, Económicas y Contables, Cali, Colombia
Profesora catedrática Universidad del Valle, Facultad de Ciencias de la Administración, Cali, Colombia.
Doctorante en Economía Agroalimentaria, Universidad Politécnica de Valencia, España.
Magister en Ciencias de la Organización, Universidad del Valle. andrea.mosquerag@gmail.com, andrea.mosquera@correounivalle.edu.co, anmosgue@doctor.upv.es; https://orcid.org/0000-0001-6329-8172
2 Profesor tiempo completo Universidad Cooperativa de Colombia, Facultad de Ciencias Administrativas, Económicas y Contables, Cali, Colombia
Doctorante en Economía Agroalimentaria, Universidad Politécnica de Valencia, España
Profesor catedrático Universidad del Valle, Facultad de Ciencias de la Administración, Cali, Colombia, emails: edward.escobarq@campusucc.edu.co, edward.escobar@correounivalle.edu.co, edesqu@doctor.upv.es
https://orcid.org/0000-0003-0358-3355

tema es Reino Unido y es pertinente señalar que la investigación realizada permite apreciar que el tema se encuentra en fase de auge.

Palabras clave: *Universidad, Gestión Universitaria, Perspectivas, Bibliometría, cartografía científica.*

Abstract

The university is a key actor in the creation of knowledge that must respond to the demands of different interest groups that asked pertinent responses and in line with global trends; so, its management has become, over time, a complex activity. Based on the above, this work is presented, which aims to publicize trends in university management through the review of the Web of Science and Scopus databases. The records obtained were analyzed using Graph theory and tools such as Bibliometrix. The results allowed identifying four perspectives: a. technology transfer and university entrepreneurship; b. educational model; c. Change management in academic institutions and d. Interest groups. Through a network analysis, it was determined that the most relevant authors are Henry Etzkowitz, Mario Raposo and G.E. Zborovsky. For its part, the region with the highest production in the subject is the United Kingdom and it is pertinent to note that the research carried out allows us to appreciate that the subject is in the boom phase.

Keywords*: University, University Management, Perspectives, Bibliometrics, mapping science.*

JEL classification: M10, I120, L26

Introduction

Universities are vital entities in the generation and transmission of knowledge; however, an increasingly active role is necessary with the use of experience in the business sector, mainly in technology-intensive areas (Julia Igual et al. 2020). Thus, Crow, et al (2020) state that higher education is an essential public service industry that has entered an era of rapid changes where its results, professional training, publications, innovation, technology, among others, generate value and provide a service to society that ultimately translates into academic and practical benefits for universities.

Until now, many empirical studies approach university governance from a perspective mainly oriented to changes in the socio-political environment and the contribution to the sustainable development (Iqbal y Piwowar, 2021) Other studies refer to the impact on university management of the transformations that have arisen in the environment (Lee 2015). They are carried out as qualitative case studies that present descriptive results. Consequently, there is a margin for research in university management that takes up empirical work in order to contribute to the development of theory (Bronstein and Reihlen 2014; Huisman and Tight 2016; Perna et al. 2020).

Despite its relevance, the literature focused on University Strategy and Management is scarce, which is how this article seeks to determine the most relevant dimensions and trends in the field of higher education and university management in order to provide a benchmark for future research in this area. To do this, a literature review was carried out based on scientific cartography techniques and network analysis, which allows showing its current state, as well as identifying research trends or perspectives. Said process was developed by searching databases such as Web of Science (WoS) and Scopus to include a greater number of journals and obtain the largest number of documents on the subject; then, bibliometric analyzes were carried out to identify the authors, countries, and journals with the highest production in the area. Finally, through the analysis of citations, the perspectives or currents of the topic were identified.

This made it possible to describe the key aspects that should guide the strategy in higher education institutions, such as technology transfer and university entrepreneurship, the pedagogical model and technology, change management and the interest groups to whom it must respond university.

University management has not been reviewed from a bibliometric point of view, focusing mainly on an analysis of the capacities of higher education institutions based on the publications generated in the area, finding limitations since the prevalence of areas covered and journals indexed are different , our work reduces the bias generated by using only one of the databases (Bryman 2007; Perkmann et al., 2013; Kotsemir and Shashnov, 2017).

This bibliometric analysis provides an additional empirical perspective to research on university management, governance in universities and new managerialism in public organizations. Also, this work can be useful for researchers specializing in higher education, and policy-makers, administrators, managers working in the field of universities and higher education, becoming a provider of information that can help them improve the management, strategic planning and decision-making of university managers.

This article is structured as follows: the second section appraises the methods used in our study, which includes the search, selection, and processing of articles, the third section presents the findings and the discussion of these findings. Finally, the conclusions, implications, limitations, and areas of further research are presented.

Methodology

The methodology was developed throw scientific mapping. A search was carried out in WoS and Scopus, since these databases are the two world-leading and competing citation databases (Yang et al., 2017) and are considered the most important (Bar-Ilan, 2008). The results obtained were analyzed through Scientific Mapping using five bibliometric methods proposed by Zupic and Čater (2015). Finally, the perspectives or subareas of the field under study are identified.

The related search parameters below in the table 1:

Table 1: Search and criteria

Applied Filters	Database	
	Web of Science	Scopus
Searches	Title, abstract, author keywords, and Keywords Plus.	Title, abstract, keyword
Time restriction	2000-2019 (Search date July 2nd)	
Document Type	Article, Books, Book Chapters and Conference papers	
Journal Type	whatever	
Keyword combination	“University Strategy” OR “College Strategy” OR “University Management”	
Total per database	482	1235

Source: Compiled by the authors

Step 1: for scientific mapping, the bibliometric methods suggested by Zupic and Čater (2015) are used: citation analysis, co-word analysis, co-citation analysis, co-author analysis, and bibliographical coupling analysis. The first method relates to the publication history by database, country, journal, and author. The second shows the most representative words of all the documents. The third shows the citation and collaboration network. The fourth represents the collaboration between authors. Finally, the fifth connects the documents based on shared references, allowing them to identify emerging fields, in this case, perspectives. The tool used for this process is Bibliometrix by Aria and Cuccurullo (2017), which has been widely used in the scientific mapping (Javid et al., 2019; Pourkhani et al., 2019; Puck & Filatotchev, 2018; Tani et al., 2018).

Step 2: to identify the perspectives, the clustering algorithm proposed by Blondel et al. (2008a, b) is used. This technique allows through a co-citation analysis to classify the documents in the different groups. Later, through text mining programmed in R with the WordCloud package (Ohri, 2012), the themes that make up the perspectives are identified. Once these perspectives are identified under bibliometric criteria (Zupic & Čater, 2015), a review of the 50 documents from perspectives.

Results

Figure 1 shows the documents published in the WoS and Scopus databases related to the strategy and university management between 2000 and 2019. The period between 2000 and 2007 had the lowest production; after this, the publication of research framed in the theme has increased significantly. As shown by the trend lines, there is an increase in the scientific community's interest in this area of knowledge, which is reflected in an annual growth rate of 19.4%. The behaviour of the number of publications in both databases is very similar in the last 5 years, however, as expected, the number of publications in Scopus is higher than in WoS, this due to the number of journals that are indexed, and to their different area coverage, being the nature and engineer science prevalent in WOS, while in SCOPUS social sciences are prevalent (Duarte et. al, 2020). During 2019 (the period of highest production), 164 documents were published in Scopus, representing around 14% of the total production in this database).

Among the ten countries with the highest production, 40% are European, which shows that this region plays an essential role in scientific production in this field. The United Kingdom ranks first in the world with publications between WoS and Scopus, followed by Australia, the United States, and finally Spain. The remaining 60% of the annual production is not explicitly concentrated in one region; for example, China, Russia, and Malaysia are also significant contributors. The leadership of these countries can be explained to some extent by the strong academic collaboration between them.

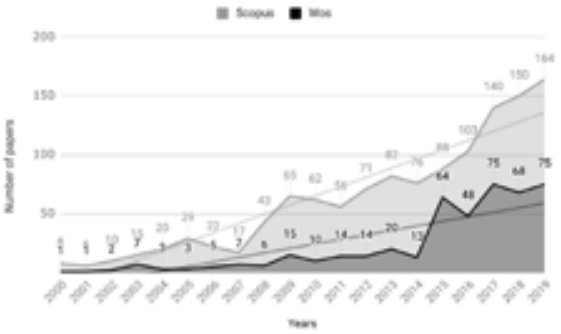
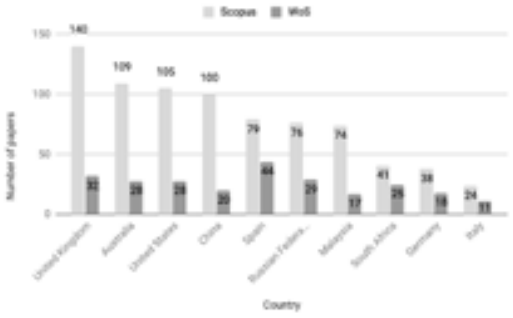
Annual scientific production in university strategy and management	10 Countries with the highest production of scientific articles
	

Figure 1: Scientific production in strategy and management

Source: Compiled by the authors

Table 2 provides the list of the most relevant authors cataloged by the number of documents published in each database and the H-Index relation. The Scopus database has the 5 most published authors in university management and strategy, it is valid to highlight that the first three, *i.e.*, Ana Ramona Bologa, Razvan Bologa and Mihaela Muntean have co-authored publications(Muntean, -R. Bologa, Bologa, & Florea, 2011a, 2011b; Sabau, Bologa, Bologa, & Muntean, 2009; Sabau, Muntean, Bologa, Bologa, & Surcel, 2009) from Bucharest University of Economic Studies. Nevertheless, the H-Index of these authors is not the highest in this list, Mario Raposo (University Beira Interior) leads the list of this indicator with 38, followed by GE Zborovsky (Ural Federal University) with 31, and Helena Alves (University Beira Interior) with 27. Two authors (Altopiedi and Ambarova) do not appear in Google Scholar.

Table 2: Most relevant authors

Scopus			WoS		
Author	**Number of Publications**	**H index**	**Author**	**Number of Publications**	**H index**
Bologa, Ana Ramona	5	5	Sanchez, Moreno M.	4	22
Bologa, Razvan	5	4	Altopiedi, Mariana	3	4
Muntean, Mihaela	5	4	Alves, Helena	3	27
White, Kate Jenson	5	11	Ambarova, Pa	3	3
Yu Yan	5	2	Cichon, Seweryn	3	4
Alves, Helena	4	27	Erdmann, Alacoque L	3	11
Dealtry, Richard	4	8	Mainardes, EW	3	17
Pal, Bijay Baran	4	11	Raposo Mario	3	38
Raposo, Mario	4	38	Zborovsky, G.AND.	3	31
Sabau, Gheorghe	4	4	Aragones Beltran P	2	12

Source: Compiled by the authors

Table 3 shows the ten scientific journals with the highest number of papers associated with the topic of university management and strategy in the Scopus and WoS databases. An analysis is also carried out on the scientific journals that have published about higher education, strategy and university management in both databases simultaneously. The following data were obtained:

Table 3: Most important scientific journals

Journal	Number of Publications	Quartile	Database
Higher Education	19	Q1	Scopus
	11		WoS
Journal of Higher Education Policy and Management	17	Q2	Scopus
	5	Q3	WoS
Studies in Higher Education	14	Q1	Scopus
	9	Q1	WoS
Scientometrics	8	Q1	Scopus
	7	Q1	WoS
Higher Education Policy	13	Q1	Scopus
	5	Q3	Wos
Tertiary Education and Management	17	Q1	Scopus
Venezuelan Management Journal	14	Q3	Scopus
	4	Q4	WoS
Revista de Educación	8	Q2	Scopus
	7	Q2	WoS
Social Sciences Journal	5	Q4	WoS
	5	Q4	Scopus
University and Society Journal	12	NA	WoS

Source: Compiled by the authors

Network analysis

The class modularity algorithm that allows different communities (perspectives) integrated by densely connected nodes to be visualized within the network (Blondel et al., 2008b) was applied to it. Four perspectives were identified between 260 documents analyzed: 1) technology transfer and university entrepreneurship, 2) educational model, 3) change management in educational institutions and 4) stakeholders.

The largest nodes are the most frequently cited documents within the network, that is, those that are considered the most relevant in this field of knowledge, in this case the 4 most important were pointed out. The perspectives generated are described below:

Perspective 1: Technology transfer and university entrepreneurship

The first of the 4 dominant approaches to trends in university strategy and management focuses on studying technology transfer and university entrepreneurship. Argue that university research continuously create innovation since it generates knowledge that is then disseminated to adjacent companies and entrepreneurs and ends up influencing revenues for the universities, as well as regional economic development. The authors establish that TLOs encourage interaction with the external sector and from there the commercialization of research results; their study is relevant because it establishes the organizational practice and environmental elements like factors that affect the success of TLOs and how are strategics for universities committed to the commercialization of the knowledge (Friedman & Silberman, 2003; Siegel, Waldman and Link, 2003; Gregorio y Shane, 2003; Debackere y Veugelers, 2005; O'Kane, Mangematinb, Geogheganc y Fitzgeraldd, 2015).

There are even discussions about the fact that inventions should be patented, but that it is inconvenient to patent the results of research, since this ultimately ends up affecting the backward movement of science when commercializing knowledge (Perkmann et al. 2013; Nelson, 2004; Calderini et al. 2009; Chang et al. 2017; van de Burgwal et al. 2019)

With respect to university entrepreneurship, (Etzkowitz, 2013; Wright, Piva, Mosey and Lockett, 2009; Gür, Oylumlu, Kunday, 2017) states that companies (clusters) and universities must unite to create applied knowledge. The commercialization and transfer of knowledge created in universities are multidimensional phenomena for sustainable development and competitiveness. Thus, "entrepreneurial university", the third substantive function associated with higher education institutions besides research and teaching, arises. The association between companies and universities is very important for the development in the future (Saeed, et al., 2014; Pérez-Macías, et al., 2019).

Finally, knowledge transfer is another important aspect (Giuri, Munari, Scandura, Toschi, 2019) where the strategy is fundamental and must be connected to the activities of the institution to generate results in synchrony, from the mobilization of results towards the community and society in general.

Perspective 2: Educational Model

The educational model approach is oriented towards the organization and development of teaching and current pedagogical strategies where technology and virtuality play a decisive role. Technology is critical for achieving quality learning in the midst of the existing gaps between developed and emerging economies that are mainly evidenced in the obstacles to the adoption and use of ICTs like infrastructure, number of computers by student, between

others, where the development of effective and efficient strategies to improve the performance of institutions allows the development of appropriate skills and competencies in students; It is also found that the student's self-management is a preponderant factor for the success of the strategies (Harvey Chaputula, 2012; Pienaar and Zhao, 2017, Aldholay et al., 2018)

The work of Tan, et al., (2017) which strengthens the pedagogical model, is under this perspective. The authors establish that there are "citizen behaviors" of the students in the university, specifically in the so-called international branch campuses (IBC), it is to say, those universities located in a country other than the campus of origin (Lane, 2011; McBurnie & Ziguras, 2006). Some IBCs develop relational marketing strategies that, based on the theory of social capital (Bolino et al., 2002; Nahapiet & Ghoshal, 1998) transform students into an active part of social capital and constitute collective action towards greater effectiveness of organizations through rules, procedures or networks (Hitt et al., 2002; Woolcock & Narayan, 2000).

Perspective 3: Change management in academic institutions

Some literature argue about the "new management", with respect to its role in the higher education reform where exists the needs of creates reforms political and technical in the way to do the things, for that thing the authors used like reference a project on higher education management in the United Kingdom. It's a priority to change and adopt the ideologies of "new management", where a traditional academic not neccesarily its going to be in confort but it is what current higher education demands (Deem & Brehony, 2005; Deem, 2012).

Studies that provide a view from organizational management, where elements such as cultural intelligence (CI), financial interests are analyzed (Huisman and Currie, 2004), the conditions of the staff, the work environment, among others that in certain cases blur the proposed strategy (Girotto, Mundet and Llinás, 2013) when run they can even generate syndromes like bornout (Zábrodská et al., 2018), the implementation of work-family balance policies by the university, especially, flexibility policies, appropriate licensing arrangements and care arrangements (for example, university in the child care place), as well as support from administrative staff to relieve the burden of administrative tasks, where the actions should be particularly aimed at younger professors, who seem to represent the most vulnerable sociodemographic group to exhaustion and to other psychological forms of tension.

The leadership must be efficient and effective to account for the complexity of the environment and in turn of the higher education institutions themselves, considering that it is essential to promote organizational transformation in times of great paradigmatic changes (Johnson and Deem, 2003; Serrano, 2010; Rosenblatt, Worthley and Macnab, 2013; Krucken, Blumel and Kloke, 2013; Howells, Karatas –Ozkan, Yavuz and Atiz, 2014; Huang and Pang, 2015; Shepherd, 2017) towards orientations as an entrepreneurial university, strengthening the transfer of knowledge and technology thinking about the social and economic development of the directly related territory in search of greater business competitiveness and improving the quality of life of the population.

Perspective 4: Stakeholders

Stakeholder theory explain this perspective where the work of identify the expectations of different stakeholder groups, including students, community, local community or society, parents (or families of students), among others in public or private universities that are in factors like a high level of academic quality, the connections of the university with the labor market, personal self-fulfillment and the predominance of the

university environment (Mainardes, et al.,2012; Slaba, 2015). This findings are key elements to choose a university and should have priority for university managers. Even though they are not directly related to higher education institutions, it is worth mentioning the link between interest groups and the activities of the organizations, in this case universities through the social responsibility that is implicit in their mission (Clarkson, 1995; Donaldson and Preston, 1995; Mitchell et al., 1997).

In their empirical findings (Dobbins & Knill, 2017; Dobbins y Khachatryan, 2014) reveal a mixed convergence and divergence pattern. While the financial area is characterized by a strong common movement towards the market-oriented model, a less consistent image regarding staff autonomy is noticeable. The works reveal the governance models of higher education in European countries, determining the State as a determining actor in the changes and evolution of the System and in the interrelation between the other actors.

The participation of interested parties in strengthening education in higher education institutions (HEIs) is important for the development of the entrepreneurial ecosystem. The participation of external actors can occur in educational activities for curricular entrepreneurship, in extracurricular business education activities or in both where, according to the study, interest groups in the context of business education are classified as follows: entrepreneurs (ENT); companies (COM); financial institutions (FI); support service providers (SSP); accelerators and incubators (AI); student organizations (SO); students (AL); higher education institutions (HEI); technological and scientific parks (STP); government organizations (GO); non-governmental organizations (NGOs); and other organizations (OO) (Bischoff et al., 2018).

Conclusions

There is an increasing interest of the scientific community in this area of knowledge. The United Kingdom has the first place in the Scopus database with 117 publications. Spain is one of the reference countries with 75 publications in Scopus and 40 in WoS. Out of the 15 countries that lead the world academic production in university strategy and management disaggregated by database, 10 countries (Spain, Australia, China, United States, the Russian Federation, Germany, Malaysia, South Africa, Brazil, Italy) are in both databases.

The journal with the largest number of publications on the subject is *Higher Education* (30 publications), followed by Studies in Higher Education (23 publications) and the Journal of Higher Education Policy and Management (22 publications), in both data base (Scopus and WOS). Higher Education Policy and Venezuelan Management Journal can also be highlighted, the latter is the only one representing Latin America.

Europe has had an important evolution regarding the development of the study area. However, for Latin America, Africa and Asia this field still needs to be explored; Brazil is the only representative country for Latin America. Without a doubt, Henry Etzkowitz has the articles with the largest number of links as evidenced in the cocitation network. Other relevant researchers are Mario Raposo, GE Zborovsky and Helena Alves with the most higher h- index.

The network presents four relevant perspectives in the field of university management allows a fairly concrete look at the subject analyzed: technology transfer and university entrepreneurship, educational model, change management in academic institutions, and stakeholders.

In line with the first perspective, the technological field takes special relevance in university management; organizing the system from the technology transfer offices (OTT) and academic entrepreneurship (Wright, et al., 2009) is a strategy that contributes to the coordination of efforts and offers the process a consistent evolution, raising the role of the university towards relevant responses to the needs of society like to create enterprises and reforce the relation between university and industry (Dobbins and Knill, 2017; Srinivas and Viljamaa, 2008; Cortés-Aldana, et al., 2009; O'Kane, et al., 2015; Franco and Haase, 2015), where models are located that present a dichotomy between the academic and the commercial part in the technology transfer processes (Etzkowitz and Leydesdorff, 2000; Siegel, et al., 2003; Di Gregorio and Shane, 2003; Debackere and Veugelers, 2005; Friedman and Silberman, 2003; Nelson, 2004; Gür, et al., 2017; Giuri, et al., 2019; van de Burgwal, et al., 2019).

The technology transfer offices have become transcendental elements for the commercialization of knowledge, however, the literature presents the dilemma against the characteristics that the leader of said agency must have to strengthen communication with the environment, the company and society ; without losing the academic value of the product being transferred (O'Kane, Mangematinb, Geogheganc y Fitzgeraldd, 2015; D'Este et al., 2013; Siegel et al., 2003; Debackere and Veugelers, 2005).

The governance model then becomes a key edge for organizational development since it has a positive or negative impact on the effective achievement of the established goals. Definitely, the role of the teaching staff that assumes managerial positions can get into dichotomous situations with academic and economic interests that shape the complexity of university management and also the differences between the vision of academic people and administrative people in institutions of higher education can be facilitate or hinder the activities and finally the fulfillment of the strategy, including social responsibility practices (Badigannavar and Kelly 2005; Bryman 2007; Weick 1976; Deem * and Brehony 2005; Deem 1998; Krücken, et al. 2013; Sánchez-Moreno and Altopiedi 2016; Asaad et al. 2015; Sánchez-Moreno et al. 2015; Parakhina et al. 2017; Ruiz-Corbella and Ruiz 2016; Plessis and du Plessis 2017; Plessis and du Plessis 2016), taking organizational behaviors such as isomorphism (DiMaggio and Powell 1983; Ambarova et al. 2019).

The reputation gained in the development of missionary functions (teaching, research, social projection and extension) plays a transcendental role in the positioning before the various interest groups linked to higher education, largely determining the focus of attention on the organizational strategy and that it is also related to the decision regarding which activity should have greater focus for the higher education institution (D'Este et al. 2013; Kurtulmuş et al. 2016).In addition, universities turn to marketing to improve the possibilities of attracting students and use positioning in international rankings as an element of differentiating value in order to consolidate their reputation with different interest groups (Tan et al. 2017).

Finally, academic excellence is a preponderant factor in universities with high quality parameters; thus, research is a component that substantially contribute to the reputation of universities and other higher education institutions (Dobbins & Knill, 2017; D'Este & Perkmann, 2011; (Moreno and Altopiedi 2016; Parakhina et al. 2017; Krücken et al. 2013; Tan et al. 2017). Being the use of technology in a preponderant way a key element, even more so with the changes that Covid-19 imposed on educational institutions, forcing the development of virtual, combined, distance education, among other ways that of course It must comply with national and

international quality parameters, even with the millions of difficulties, challenges and limitations that arise, especially for those countries that are poorer and / or with less preparation in the implementation of technological tools in higher education (Macharia and Pelser 2014; Chawinga and Zinn 2016; Pienaar and Zhao 2017).

The results of students and graduates are one of the ways to measure the excellence of a university, and there various authors analyze, where the institution has the responsibility to transfer knowledge, however, the successful performance of students is associated not only with elements academic but also emotional, cognitive, social and economic aspects (Balogun et al. 2017; Macharia and Pelser 2014; Jogee et al. 2018; Pérez-Macías Martín et al. 2019; Aldholay et al. 2018).

Limitations and future research

As well as other works of research, the literature review presented in this paper has limitations. Firstly, the initial search was conducted in the WoS and Scopus databases, as an expected consequence, the works of research that are not included in these databases are outside the scope of the current study. Secondly, the search equation used the terms “university strategy” OR “college strategy” OR “university management”, which could imply certain limitations due to the exclusion of keywords related to university management. For future research a meta-analysis and a deeper analysis of the proposed perspectives of this field are suggested.

Furthermore, this work may be excluding documents that have used the concept of higher education as a reference and that may include elements that were disregarded in the analysis and have been visualized as a next step in the work of research.

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