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Organizational structure of universities. Research trends in Scopus over the last decade

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Abstract

Organizational structure (OS) is the foundation upon which organizations are built, and for universities, it also reflects their educational and social framework. This study focuses on research trends from 2014 to 2024 regarding university organizational structures (UOS). A bibliometric analysis of 647 documents retrieved from Scopus formed the basis of the methodology. This analysis employed VOSviewer to assess production, impact, and collaboration metrics, in addition to evaluating keyword co-occurrence and author co-citations. The results classify UOS as a motor theme with a growing trend, predominantly featuring authors, journals, and affiliations from the United States of America (USA), and countries from Asia and Europe. A small number of sources concentrate scientific production and although no major producers are identified, thematic leaders of collaborative nuclei are recognized for their study. The conclusions underscore the substantial interrelationship of UOS with knowledge management, human resource management, information systems, educational processes, quality assurance, and sustainability. Thus, the continued pertinence of this trend, in subsequent investigations within the realm of university and higher education, is anticipated.

Keywords: organizational structure; university; higher education; bibliometric analysis.

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Estructura organizativa universitaria: Tendencias investigativas en Scopus durante la última década

Resumen

La estructura organizativa (EO) es el cimiento donde se construyen las organizaciones y para la universidad, es además el reflejo de su marco educativo y social. El estudio se centra en las tendencias investigativas en el período 2014-2024 sobre la estructura organizativa universitaria (EOU). La metodología se basó en el análisis bibliométrico de 647 documentos de Scopus. Con el empleo de Bibliometrix se aplicaron métricas de producción, impacto y colaboración, así como análisis de coocurrencia de palabras clave y de cocitación de autores en VOSviewer. Como resultado se clasifica como un tema motor de tendencia creciente, donde predominan autores, fuentes e instituciones de Estados Unidos de América y países de Asia y Europa. Un reducido número de fuentes concentra la producción científica y aunque no se identifican grandes productores, se reconocen líderes temáticos de núcleos de colaboración para su estudio. Las conclusiones reflejan una fuerte relación de la UOS con la gestión del conocimiento, la gestión de recursos humanos, los sistemas de información, los procesos educativos, la garantía de la calidad y la sostenibilidad, por lo que se espera que esta tendencia continúe vigente en investigaciones futuras dentro del ámbito universitario y de educación superior.

Palabras clave: estructura organizativa; universidad; educación superior; análisis bibliométrico.

1. Introduction

Higher education, by responding to the needs of professionals in societies, is “easier to transform, and more likely to realize system innovation” (Bao & Xu, 2022, p. 2), which distinguishes it from other educational levels. In this educational sector, universities constitute the largest official social organizations for knowledge management (Shafiee et al., 2020), characterized by a unique OS (Clark, 1991; Kováts, 2018).

The dynamics of scientific production have increased interest in bibliometric analysis, as it allows for the review of all relevant literature to determine the evolution and characteristics of any field (Öztürk et al., 2024; Pessin et al., 2022), including the educational domain (Jing et al., 2023). Within this framework, UOS has been considered as part of the systematic studies of bibliographic analysis (Donner, 2022; Fumasoli et al., 2020; Forliano et al., 2021; Skute et al., 2019).

Donner (2022) developed a systematic literature review on Leavitt’s classical model of organizational change (Leavitt, 1965), applied to research data management systems in universities, where OS is one of the factors. Meanwhile,

Fumasoli et al. (2020) conducted a systematic review on the determinants of university strategic positioning, recognizing OS as a component of the organizational dimension. Forliano et al. (2021) performed a bibliometric analysis on entrepreneurial universities mentioning the need to adapt OS for change. Skute et al. (2019), in their bibliometric mapping of the university-industry collaboration field, emphasized the mediating role of OS. Although these studies have points of contact with UOS, no publication was detected in the examined scientific literature that allows for identifying the evolution, authors, affiliations, sources, countries and the most relevant publications in this topic. Therefore, the primary objective of this article is to examine the main research trends regarding UOS in the last decade.

The article is divided into six sections, beginning with the introduction. The second section describes the literature review, the third one includes the research design while the fourth one presents the results of its application. The fifth section develops the content analysis of approaches emerging from the metrics, and the last one provides the conclusions.

2. Organizational structure of universities: Literature review

The evolution of university concept reflects an increasingly active societal role that extends beyond education and continues to grow, acting as agent of economic and social development (Romero-Hidalgo et al., 2021). This has triggered an organizational renewal that has transformed universities into complex institutions characterized by structural arrangements (Ganga-Contreras & Nuñez-Mascayano, 2018; Ryttberg & Geschwind, 2021; Salahudin et al, 2019), whose OS is divided into administrative and academic units (Clark, 1991; Kováts, 2018; Maassen & Stensaker, 2019). Consequently, this structure hinders organizational change (Maassen & Stensaker, 2019; Stensaker, 2015).

The OS, as described by Erol and Ordu (2018, p. 775), is “a combination of relationships in which the work is divided through tasks and roles and then coordinated with communication and management processes.” This inherent nature of OS makes it a crucial factor in determining the quality of an organization’s processes (Cao et al., 2023; Frank & Meyer, 2024; Teslia et al., 2020; Wang et al., 2023).

UOS have received extensive scholarly attention, encompassing both empirical and theoretical investigations. Notable empirical studies include those by Alsharif (2024), Barbato et al. (2021), Drysdale (2021), García-Hurtado et al. (2024), Romero-Hidalgo et al. (2021), and Shafiee et al. (2020). Concurrently, significant theoretical contributions have been made by Akşit (2018), Cohen et al (1972), Clark (1991), Maassen & Stensaker (2019), Weick (1976), Wittrock et al. (2021), and Woelert & Stensaker (2024).

Among the studies, universities are notably recognized as organized anarchies (Cohen et al, 1972) within loosely coupled systems (Clark, 1991; Weick, 1976; Woelert & Stensaker, 2024), where academics play a central role as the operational core (Clark, 1991; Mintzberg, 1979; Wittrock et al., 2021; Woelert & Stensaker, 2024). The primary basis for labor division in universities lies in disciplines (Clark, 1991), where each academic group (for instance, discipline, department, faculty) exhibits distinctive

characteristics that shape institutional features.

Recent literature has examined key areas such as university integration (Maassen & Stensaker, 2019; Woelert & Stensaker, 2024), entrepreneurship (Etzkowitz & Zou, 2017; Forliano et al., 2021; García-Hurtado et al., 2024; Skute et al., 2019), and sustainability (Alsharif, 2024; Cao et al., 2023). Simultaneously, rapid technological advancements are transforming university structures (Romero-Carbonell et al., 2023; Ryttberg & Geschwind, 2021; Simchenko & Berkovich, 2021; Teslia et al., 2020; Wang et al., 2023).

In this context, the way universities organize their structures becomes critical, particularly given the prevalent rigid hierarchical-functional approaches (Alsharif, 2024; Teslia et al., 2020). As a result, more flexible structures are required (Fumasoli et al., 2020; Maassen & Stensaker, 2019; Woelert & Stensaker, 2024). Addressing this topic through rigorous scientific inquiry using bibliometric analysis can reveal gaps and emerging priorities.

3. Materials and methods

The research followed a mixed approach, fundamentally based on quantitative techniques (Okumus et al., 2018; Öztürk et al., 2024) and complemented with qualitative content analysis of keywords and authors. It was also descriptive as it presented "properties and characteristics of concepts, phenomena, variables, or facts within a specific context" (Hernández-Sampieri & Mendoza-Torres, 2018, p. 108), focusing on universities.

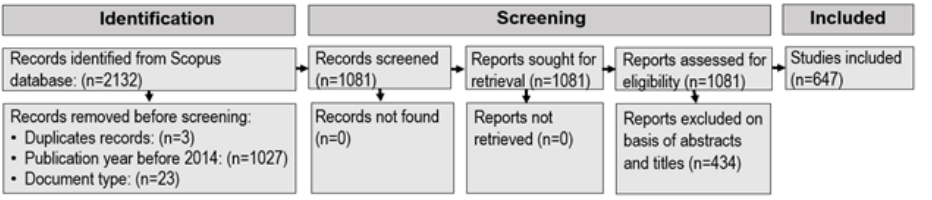
The software used included Bibliometrix from R-Studio, VOSviewer, and Microsoft Excel. Based on methodological proposals for bibliometric studies (Marín-Suelves & Ramón-Llin, 2021; Donthu et al., 2021; Moreno, 2019; Öztürk et al., 2024; Pessin et al., 2022), five steps were established: 1) setting the objective, 2) selecting the database, 3) choosing the documents, 4) analyzing the metrics, and 5) interpreting the content.

Step 1: The objective was set to identify research trends on UOS in the last decade.

Step 2: The study was restricted to Scopus, which is considered the second most comprehensive citation database in temporal coverage, with recognized prestige in the scientific field (Granda-Orive et al., 2013; Zhu & Liu, 2020).

Step 3: The keyword combination was deployed in the fields: Title, Abstract and Keywords using the search equation "Organizational Structure" AND "University" OR "Universities" OR "Higher education". The subject areas: Social Sciences; Business, Management and Accounting; Economics, Econometrics and Finances; and Decision Sciences were included. The initial identification in the Scopus CSV file yielded 2132 documents, which were reduced through the removal of duplicates, limitations by document type (Article, Conference paper, Book, and Book chapter), and by year (2014-2024) (Diagram 1). Documents were also excluded based on an assessment of their titles and abstracts, which were unrelated to the mentioned subject areas. Finally, 647 documents were selected for the study.

Diagram 1
Flow diagram for document selection process



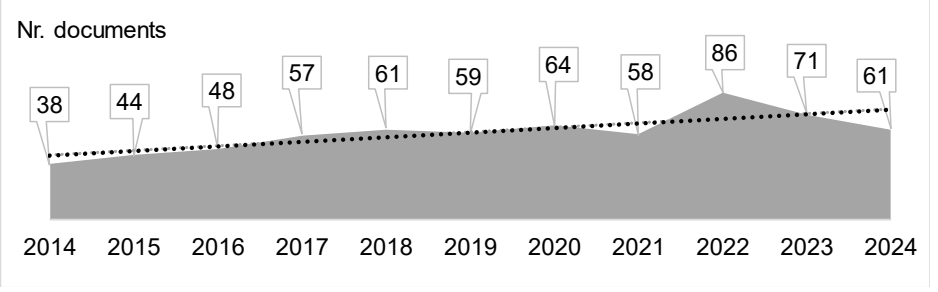
Step 4: Regarding publications, 479 sources, 1,989 keywords, 25,070 references, and 1,739 authors were identified. The documents types included scientific articles (68%), conference papers (16%), book chapters (14%), and books (2%). In describing the trends, production, impact, and collaboration indicators were taken into account.

Step 5: Analyses of keyword co-occurrence and author co-citations were performed. The combination of both approaches allows for the visualization of the general landscape and the evolution within a research area (Leung et al, 2017).

4. Metrics results

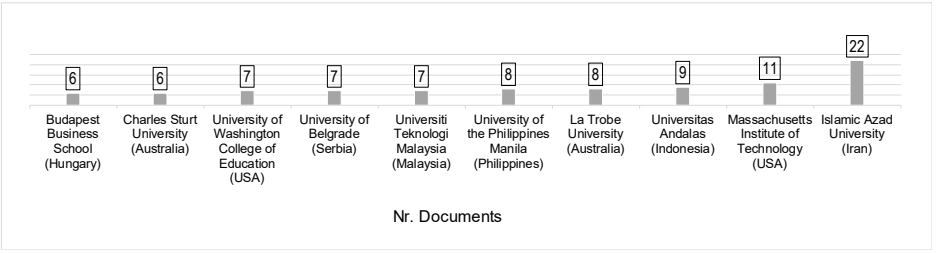
The scientific production over the last decade shows an upward trend (Graphic 1) with a peak in 2022. The countries with over 50 publications are: the USA (301), China (113), Indonesia (100), Germany (83), Spain (72), Australia (64), Brazil (62), Iran (62), and the United Kingdom (UK) (51). However, according to continents, Europe accounts for 32.29% of publications, North America for 19.80%, Asia for 19.01%, South America for 11.04%, Oceania for 10.20%, and Africa for 7.66%.

Graphic 1
Documents per year



The most relevant affiliation identified is Islamic Azad University from Iran, accounting for 3.40% of the publications (Graphic 2) and the source with the highest number of documents is Studies in Higher Education from the UK, with 1.70% (Graphic 3). Based on Bradford's Law (Bradford, 1934), sources were distributed into three zones with a similar number of publications (Table 1).

Graphic 2
Most relevant affiliations per number of documents



Graphic 3
Most relevant sources per number of documents

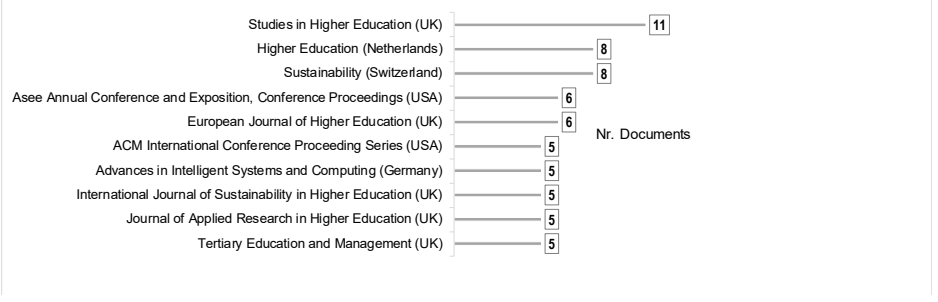
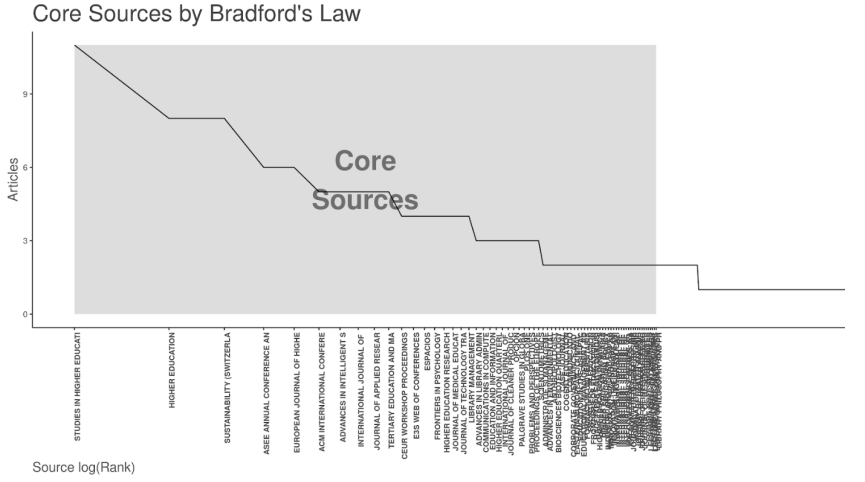


Table 1
Delimiting zones by Bradford's Law

Zone	Sources	%	Frequency	%	Frequency/ Sources
1	71	14,82%	214	33,08%	3,01
2	195	40,71%	220	34,00%	1,13
3	213	44,47%	213	32,92%	1,00

In the first zone (Graphic 4), which comprised 14.82% of the sources, 33.08% of publications are concentrated for a ratio of 3.01 publications per source, as a dominant nuclear zone in this subject. Within this zone, 77.46% of the sources comprise the USA, with nine sources (29 documents), and European countries, with 46 sources (144 documents).

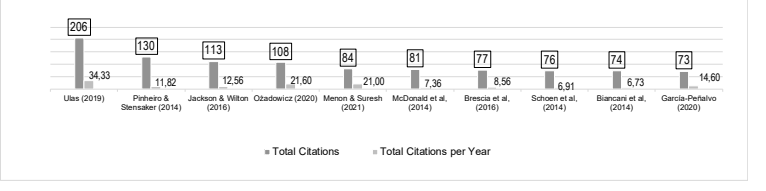
Graphic 4
Core sources by Bradford's Law



In the author productivity analysis, according to Lotka's Law (Lotka, 1926), 51 authors, representing a 2.93%, were found to have more than one publication. Within these, Gergely Kováts, Theodor Leiber, Joanna Mnich, Susi Poli, and Zbigniew Wisniewski with three publications each, and Ilse Hagerer and Bjørn Stensaker with four publications each. The latter two, representing 0.01%, are considered medium producers, while the remaining 99.99% are occasional producers. In documents by number of authors, 161 were written by one author, 175 by two authors, 152 by three authors and 489 by more than three authors. This indicates collaborations in 75.12% of the publications with an average of 2.69 authors per publication.

When reviewing the documents by citation count, among the ten most cited documents (Biancani et al, 2014; Brescia et al, 2016; García-Peñalvo, 2020; Jackson & Wilton, 2016; McDonald et al, 2014; Menon & Suresh, 2021; Ożadowicz, 2020; Pinheiro & Stensaker, 2014; Schoen et al, 2014; Ulas, 2019), the first four have over a hundred citations each (Graphic 5). Ulas (2019) is also the publication with the highest average annual citations. In these ten documents, the predominant themes are learning to develop competencies and the digital transformation it requires, where OS plays a decisive role.

Graphic 5
Most global cited documents



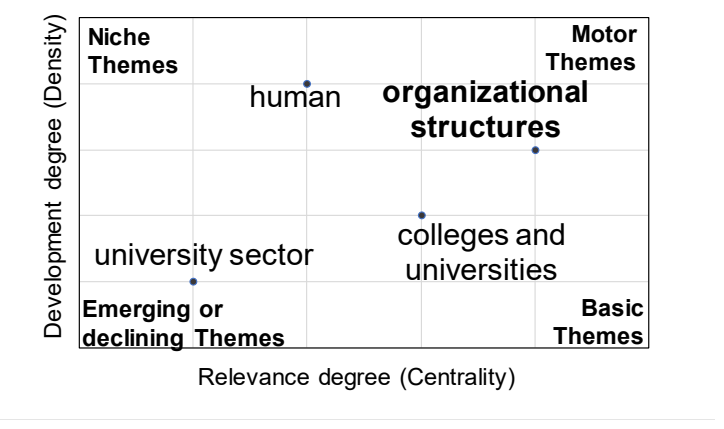
Three journals with an h-index greater than 5 emerge from the analysis: Sustainability (Switzerland; h=6), Higher Education (Netherlands; h=7), and Studies in Higher Education (UK; h=8), which is the most consolidated in the field. Among the most cited authors, four have an h-index of 3: Gergely Kováts (Hungary), Theodor Leiber (Germany), Susi Poli (Italy), and Bjørn Stensaker (Norway), the latter with the higher g-index (4).

5. Content analysis

The most frequent keywords are: “organizational structures” (73), “higher education” (28), “education” (25), “students” (20), “knowledge management” (18), “engineering education” (16), “human” (16), “decision making” (14), “e-learning” (13), and “information management” (12). These reflect interest in OS within knowledge management context from university educational functions, as well as their connection to human and informational resources and decision-making processes.

In the thematic map, four major areas are identified (Diagram 2). Among these, the area of “organizational structures” is located in the quadrant of “motor themes”, exhibiting high degrees of relevance (centrality) and development (density).

Diagram 2
Thematic map



To establish a clear relationship between keywords, co-occurrence analysis was selected using VOSviewer software. To enhance clarity and quality of the study, similar keywords to “organizational structure” “higher education”, “higher education institutions”, and “university” were normalized. The final network included 50 keywords for a minimum of six occurrences (Diagram 3), segmented into five clusters (Table 2).

Diagram 3
Keywords in network visualization

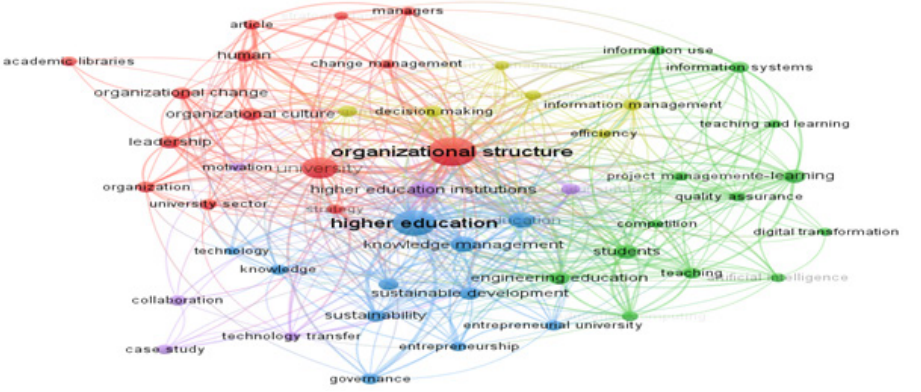


Table 2
Groups composition in keyword map

Group	Keywords	Dimension
Red	academic libraries, article, change management, human, leadership, managers, organization, organizational change, organizational culture, organizational structure, strategic planning, strategy, university, university sector	Organizational
Green	artificial intelligence, competition, digital transformation, e-learning, education computing, engineering education, information systems, information use, project management, quality assurance, students, teaching, teaching and learning	Education
Blue	education, entrepreneurial university, entrepreneurship, governance, higher education, innovation, knowledge, knowledge management, sustainability, sustainable development, technology	Knowledge
Yellow	decision making, efficiency, human resource management, information management, management, university management	Management
Purple	case study, collaboration, higher education institutions, motivation, societies and institutions, technology transfer	Engagement

The red group includes the term “organizational structure”, as it is related to the organizational dimension and within it, the “university”, “leadership”, “strategy”, “organizational culture”, and “organizational change”. The green group is associated with educational processes (for example: “teaching”, “teaching and learning”) with the impact of information technologies (for example: “e-learning”, “education computing”) and “quality assurance”. The blue group primarily includes elements indicating the role of the university in “knowledge management” based on “innovation”, “technology”, and “sustainability”.

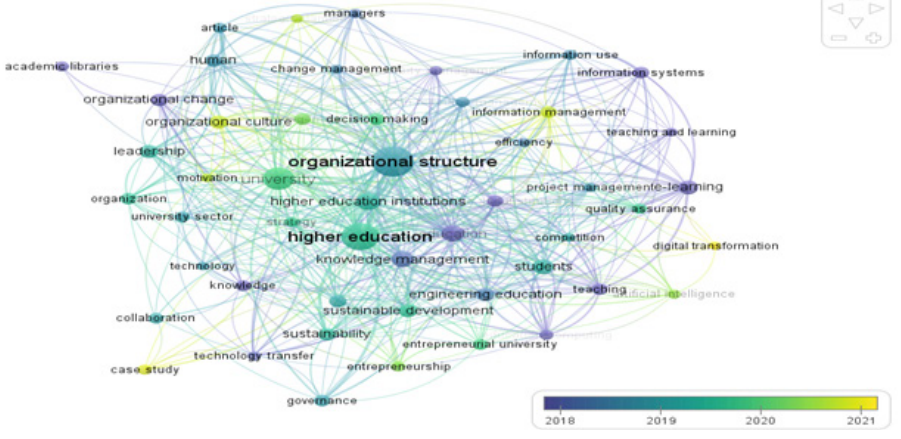
The yellow group emphasizes in “university management”, including “human resource management”, “information management”, “decision-making”, and “efficiency”. Finally, in the purple group, the engagement of the higher education sector to its environment is induced, linked through

"collaboration" and "technology transfer".

The red group contains the keywords most closely related to UOS. However, based on the strength of their connections to OS, the most significant relationships are identified with "knowledge management", "information systems", "human resource management", educational processes, and "sustainability".

When analyzing the evolution of keywords (Diagram 4), "societies and institutions", "teaching", "education", "academic libraries", and "knowledge" stand out as those with the lowest average publication year, prior to 2018. These evidence a basis in studies in this field, fundamentally related to educational processes.

Diagram 4
Keywords in overlay visualization



The keyword "organizational structure" has an average publication year of 2019, and for an average from 2020, "artificial intelligence", "digital transformation", "information management", "motivation", and "organizational culture" have gained prominence. These show the advent of the digital era in higher education with implications for UOS.

Regarding authors, a co-citation network by cited authors was constructed (Diagram 5). Four groups were identified with a minimum of 25 citations (Table 3).

Diagram 5
Co-citation network visualization

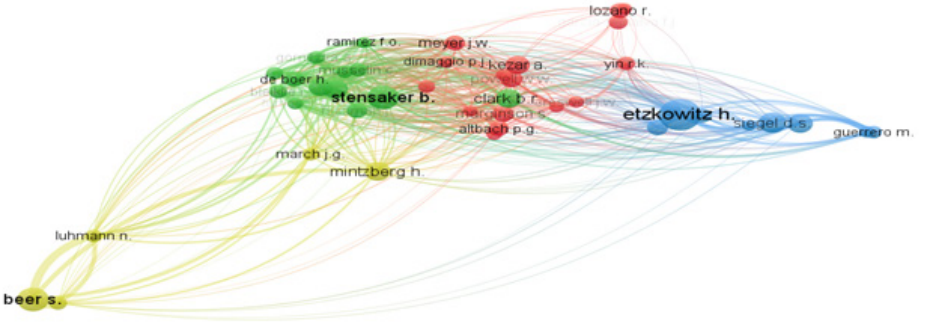


Table 3
Groups composition in co-citations map

Group	Authors	Key Themes
Red	Altbach, P. G.; Creswell, J. W.; DiMaggio, P. J.; García-Peñalvo, F. P.; Kezar, A.; Leal Filho, W.; Lozano, R.; Marginson, S.; Meyer, J. W.; Powell, W. W.; Scott, P.; Scott, W. R.; Slaughter, S.; Tushman, M. L.; Weick, K. E.; Yin, R. K.	Institutional isomorphism Institutional theory Change and globalization of higher education Sustainability in higher education
Green	Bleiklie, I.; Clark, B. R.; De Boer, H.; Enders, J.; Fumasoli, T.; Gornitzka, A.; Huisman, J.; Krucken, G.; Lepori, B.; Maassen, P.; Musselin, C.; Ramirez, F. O.; Stensaker, B.	Governance in universities Organizing and structuring of higher education Strategic approach
Blue	Bozeman, B.; Etzkowitz, H.; Guerrero, M.; Leydesdorff, L.; Link, A. N.; Nonaka, I.; Siegel, D. S.; Urbano, D.; Wright, M.	Entrepreneurial universities
Yellow	Beer, S.; Drucker, P. F.; Luhmann, N.; March, J. G.; Mintzberg, H.	Organizational theory Strategic management

The red group generally includes authors who have studied the characteristics and transformations undergone by higher education institutions, including universities. Walter W. Powell stands out with the highest number of links, primarily due to his work on institutional isomorphism (DiMaggio & Powell, 1983), which laid the foundation for understanding how universities shape their OS and functioning in response to environmental demands. This work served as a basis for institutional theory (Powell & DiMaggio, 2023), which situates the modern university beyond organizational boundaries, with a global and ever-expanding role (Frank & Meyer, 2024).

The green group comprises authors whose publications generally relate to governance and organizing in universities, mainly in the last decade. Here, the highest co-citations are with Bjørn Stensaker, whose studies show that OS becomes the axis for implementing organizational change in universities, even though they are often considered relatively stable organizational forms

(Stensaker, 2015). Additionally, the role of Burton Clark in his studies on the structure of the higher education system (Clark, 1991) is noteworthy.

The blue group includes authors collaborating on topics related to entrepreneurial universities and their role in knowledge management. Among these, Henry Etzkowitz leads as the central author in the co-citation network, reflecting how entrepreneurship in universities involves the flexibilization of their OS for innovation, as required by the triple helix model: university-industry-government (Etzkowitz & Zhou, 2017).

The yellow group identifies classic authors who have been fundamental precursors in the development of general organizational theory. Stafford Beer has the highest total link strength due to his contributions to systems principles for diagnosing organizational complexity to ensure adaptability to change (Beer, 1985). Henry Mintzberg also stands out with the highest number of co-citations for his contributions to organizational design theory, which characterizes universities as bureaucracies with a professional nature (Mintzberg, 1979, 2024). This indicates that the authors in the green group are currently working on topics most related to UOS.

6. Conclusions

The study shows the relevance of this topic in the last decade, with a growing trend. The analysis of sources, affiliations and authors revealed that the USA and countries from Europe and Asia, such as China, UK and Germany, have been the most prominent. This reflects its importance in countries with high levels of economic and social development.

Through Bradford's law, it was possible to identify how a small number of sources, mostly belonging to the previously noted geographical contexts, concentrates studies on this theme. However, Lotka's law demonstrated an overrepresentation of sporadic authors who have been developing studies involving UOS, with only two medium producers (Bjørn Stensaker and Ilse Hagerer). These authors, also from European countries, have published in some of the identified high-impact sources, for instance, Ilse Hagerer in Tertiary Education and Management and Bjørn Stensaker in Studies in Higher Education.

In contrast, the co-citation analysis identified authors whose works, beyond the quantity of publications in the period, have had significant influence on the study of UOS, such as Walter W. Powell, Paul J. DiMaggio, Henry Etzkowitz, Bjørn Stensaker, Stafford Beer, and Henry Mintzberg. These authors have become thematic leaders in collaborative networks and are key references in this field. Among them, Bjørn Stensaker is recognized for the frequency and impact of his research.

The keyword analysis indicated a high frequency of OS definitions within university research, suggesting its prominence as a foundational theme. The results of this bibliometric study lead to future research lines, such as the strong link between UOS and knowledge management; the role of UOS in the development of educational processes, particularly in the current digital transformation; the impact of UOS on organizational culture, organizational change, strategic management, governance schemes, and leadership styles; the connection between UOS and human resource management as primarily resource for universities; the flexibilization of UOS

in the transformation of entrepreneurial universities; and its role in achieving sustainability and quality assurance. Understanding the topic of UOS has been paramount to comprehending the functioning of universities and the higher education system at large. Analysis of research trends suggests its sustained relevance as an area of scholarly interest in the years ahead.

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