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Emerging Challenges and Trends in Soft Skills and Knowledge Management in University Education: An Ibero-American Perspective on Employability and Social Innovation through a Bibliometric Approach

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ABSTRACT

In the context of the profound socioeconomic changes taking place in Ibero-America, higher education faces the challenge of adapting its educational models to the demands of a highly dynamic and competitive labor environment. In this scenario, soft skills are consolidating as key competencies for employability, while knowledge management emerges as an essential tool for fostering social and organizational innovation in the 21st century. This article proposes a bibliometric analysis of recent research addressing this thematic convergence, with emphasis on scientific production generated in Ibero-America, to identify emerging challenges and trends. Through the analysis of quantitative indicators and co-occurrence networks of 77 documents from Q1 quartile journals in the Scopus and Web of Science databases, the study examines the co-occurrence network of 380 terms defined by 247 authors. Four primary clusters, representing the strongest thematic relationships, were identified: Cluster 1: University education oriented toward employability and labor integration. Cluster 2: Territorial innovation and digital capabilities in higher education. Cluster 3: Critical education, social justice, and open policies in professional training. Cluster 4: Organizational culture, leadership, and knowledge behavior. These findings help establish robust new research gaps in this field of study.

Keywords: Soft skills, knowledge management, bibliometrics, co-occurrence, Python.

INTRODUCTION

In recent years, Ibero-American higher education has undergone a process of accelerated transformation driven by digitalization, automation, and the expansion of hybrid learning environments [1]. This scenario has spurred academic interest in the development of soft skills and knowledge management as foundational pillars for enhancing employability and social innovation in the region's universities. However, various studies indicate that the integration of socio-emotional competencies remains limited and fragmented, particularly in engineering and applied sciences programs, where a technical orientation continues to prevail over transversal learning [2], [3].

Concurrently, recent research highlights the adoption of active methodologies such as Challenge Based Learning and Design Thinking (2024–2025), which foster creativity, shared leadership, and collaborative problem-solving as strategies to bridge disciplinary knowledge with students' holistic development [4], [5]. This is in line with the latest knowledge management models that, for the years 2023-2025, consider organizational culture, academic leadership, and institutional incentives as determiners of educational innovation and academic sustainability [6].

Similarly, in Spain, Mexico, and Portugal, studies conducted between 2023 and 2024 confirm the existing gaps between university training and labor market demands, particularly in aspects related to leadership, entrepreneurship, and teamwork competencies [7]. In this sense, knowledge management is assumed as a strategic component not only for the technical transfer but also as a mechanism of social inclusion and equity with the challenges of Industry 4.0 and the Sustainable Development Goals [3].

This document is structured as follows: Section 2 provides definitions relevant to the study. Section 3, Methodology, outlines the process developed for the bibliometric analysis. Section 4, Results, presents the findings obtained from the proposed bibliometric analysis. Section 5, Discussion, analyzes the results and validates the proposed hypothesis. The contributions of the current work are presented in Section 6, the Conclusions.

Definitions of the Present Study

Soft Skills and Higher Education in the Ibero-American Context

Universities in Ibero-America began to recognize the relevance of soft skills as an essential component of higher education during the initial years of the period under study. In this context, several studies emphasized the need to integrate active methodologies and digital tools that strengthened communication, collaborative work, and problem-solving in diverse academic environments [8], [9].

The COVID-19 pandemic accelerated the virtualization of teaching, highlighting the urgency of incorporating socio-emotional competencies to facilitate adaptation to digital environments and self-directed learning [10], [11]. Similarly, research in Mexico and Spain demonstrated that knowledge management through information and communication technologies enabled the differential development of competencies across educational and engineering programs [12].

During this stage, pedagogical approaches focused on sustainability and social responsibility began to include the teaching of transversal skills related to leadership, ethics, and critical thinking as essential elements for professional performance and the comprehensive development of university students [13], [14]. In summary, the literature from these years laid the conceptual groundwork for considering soft skills not merely as personal attributes but as structural components of educational quality and employability in Ibero-American higher education.

In recent years, the study of soft skills in Ibero-American higher education has undergone diversification and strengthening. Comparative research has revealed a persistent gap between the competencies demanded by the labor market and university training, particularly in areas such as leadership, teamwork, and communication [15], [16]. Concurrently, new methodological approaches, such as Challenge Based Learning and Design Thinking, have demonstrated a significant impact on the co-creation of innovative solutions and the improvement of students' generic competencies [4] .

On the other hand, recent studies conducted in Spain, Mexico, and Portugal have emphasized the importance of combining knowledge management models with emerging technologies, such as artificial intelligence, to create more collaborative and personalized learning environments [1]. Additionally, there has been growing interest in cultural diversity and educational equality, where soft skills serve as mediators for intercultural dialogue and social inclusion [13].

Finally, the contemporary perspective in the literature underscores the need to redesign university curricula from a holistic viewpoint that integrates both technical and socio-emotional skills. This would better prepare graduates to address the challenges of Industry 4.0 and social innovation in the region.

Knowledge Management and Higher Education in the Ibero-American Context

During the initial five-year period, information management at the higher education level in Latin America began to strengthen as a crucial component linked to institutional improvement, pedagogical innovation, and digital transformation. Research from this period emphasized that universities needed to strengthen methods for creating, transferring, and applying knowledge to remedy the diverse technological and social changes taking place in their environments [10], [17]. A study in Spain and Latin America found information and communication technologies(ICT) as important factors in enabling knowledge management processes and the creation of collaborative learning communities within academic groups [18].

This was also the time that management prac ce evolved towards a new model of transparency, innova on and ins tu onal sustainability. Studies dealing with organiza onal behavior and leadership roles at universi es emphasized the paramount importance of ins tu onal culture for the facilita on of knowledge management, where it is directly related to the development of intellectual capital and scien fic output improvement [11], [19]. Par cularly, studies focused on universi es in Colombia and Mexico demonstrated that integra on between organiza onal culture, leadership, and internal communica ons is essen al to the improvement of teaching and research quality [12]. These ini al contribu ons provided the theore cal basis that currently supports

an understanding of knowledge management at Ibero-American universi es as a precursor to the emergence of present conceptions.

Recently, knowledge management has synthesized a holistic approach that integrates technological innovation, artificial intelligence, and organizational transformation. A study carried out in Ecuador, Guatemala, and Peru shows that the Iberoamerican universities are turning governance models sharing knowledge as a priority tool for inclusion, equity, and sustainable development to be attained [20]. Such experience proves that communication between institutional en es, document management systems and digital platforms to support the addressing of social and educa onal problems, especially in a context of great inequality, are fundamental.

Since 2023, studies focusing on Latin American higher education have begun to demonstrate the importance of collaborative workspaces and information-sharing frameworks in supporting scientific innovation and collective learning [6]. Furthermore, there has been increasing adoption of artificial intelligence tools applied to institutional management, analysis of scientific productivity, and collaborative knowledge creation [21]. This research indicates that the integration of human capital, technological infrastructure, and institutional culture strengthens academic competitiveness and enhances universities' capacity to respond to the challenges of Industry 4.0 and the knowledge society [4].

To conclude, recent works clearly show a new stage in the Ibero-American region's knowledge management process based on inter-institutional cooperaon, digitalizacion and a focus on socially impac ul results [22].

Employability and Higher Education in the Ibero-American Context

During the initial years of the analyzed period, Ibero-American universities began facing growing pressure to align their academic programs with labor market demands. Research from this stage consistently argued that employability should be addressed not merely as the immediate job placement of graduates, but as a comprehensive process combining technical, transversal, and innovation competencies [23].

Studies conducted in Portugal and Spain identified that the main obstacles to employability stemmed from the limited connection between higher education institutions and the productive sector, as well as rigid curriculum structures and the weak incorporation of soft skills into study programs [19]. Additionally, internship and practicum programs, while valued by students and employers, revealed shortcomings in bridging academic education with labor market requirements, particularly in technical and business fields [24].

Furthermore, the improvement of employment prospects was enhanced through digitalization and the adoption of innovative approaches to generating and utilizing information, which facilitated graduate tracking and the development of academic and professional networks [25]. Collectively, these developments formed an early framework that viewed employability as a measurable outcome of the educational system and a shared responsibility among universities, industries, and Latin American governments [12].

In recent years, the focus on employability in Ibero-American higher education has evolved into a more systematic approach that examines the interconnection between education, innovation, and social responsibility. Recent studies from Ecuador, Spain, Mexico, and Brazil demonstrate the necessity of transforming university curricula to incorporate leadership, communication, entrepreneurship, and collaboration as essential attributes of the ideal graduate profile [26].

Surveys clearly indicate that the disconnect between higher education and labor market expectations persists, particularly in fields such as engineering, tourism, and health sciences, where a misalignment exists between student learning outcomes and the skills required in technologically advanced and globalized work environments [7], [25]. Moreover, research focused on the corporate sector and graduate programs reveals that universities are increasingly implementing experiential learning strategies and dual education models that connect students with workplaces from the early stages of their academic formation [2].

Recent literature also emphasizes equitable employability, positioning universities as agents of social cohesion by enhancing opportunities for historically underrepresented groups including rural youth, women, and indigenous communities through programs supported by international cooperation and scholarships focused on sustainable human development [27], [28].

In summary, contemporary research agrees that Ibero-American university employability is transitioning from a supply-oriented approach to an interdependent model involving academia, industry, and society. This shift is driven by digital transformation, knowledge management, and the need to cultivate adaptable professionals committed to sustainable development [7].

Social Innovation and Higher Education in the Ibero-American Context

In the early years of the studied period, social innovation began gaining prominence as a significant component of the university mission in Latin America. Studies from this phase indicate that universities were expected not only to generate scientific knowledge but also to develop sustainable solutions for social and territorial challenges

[10], [14]. During this time, higher education institutions assumed a key role in coordinating support networks among universities, social entrepreneurship initiatives, and activities involving vulnerable communities in local improvement projects [17].

Research in countries such as Spain, Colombia, and Mexico demonstrated that university-led social innovation is closely linked to ethical learning, social responsibility, and environmental care [12]. Concurrently, a model of university governance emerged where knowledge management focused on achieving tangible outcomes in equity, inclusion, and collective well-being [29]. These early experiences marked a transition from an assistance-based approach to a participatory model of innovation, where students and faculty became active agents of social transformation [30].

In recent years, social innovation in Ibero-American higher education has gained substantial emphasis, connecting digital transformation, environmental stewardship, and collaborative knowledge production. Multiple studies report a growth in courses focused on social entrepreneurship, circular economy, and open-source solutions, particularly in institutions across Ecuador, Brazil, Spain, and Chile [31]. These analyses reveal that university initiatives have evolved from isolated interventions into integrated environments that connect academia, industry, and local communities through active and participatory methodologies [20].

Recent literature frequently highlights the role of emerging technologies such as artificial intelligence, data analy cs, and digital pla orms in fostering inclusive forms of social innova on within universities [4]. They have allowed projects to reach more beneficiaries, they have strengthened knowledge management, they have ensured the management of aspects of transparency (who does what and how?), Ibero-American universities have recently begun to implement a set of social and environmental impact indicators that allow them to demonstrate their real contribution to sustainable development and the achievement of the 2030 Agenda goals [32].

In contemporary times, social innovation is viewed as the axis that links education, research, and the third mission of universities. This leads to shared value creation and strengthening of the social fabric through higher education. It is reflective of a change in paradigm: not just knowledge creators, universities are seen as earnest co-creators of solutions with direct impact on, Quality of life, fairness, and sustainability in Ibero-American communities. [22].

Applications of the PRISMA Methodology in Soft Skills and Knowledge Management in Ibero-American University Education

In the ini al years of the period analyzed, the applica on of PRISMA methodology was becoming established as a rigorous tool for systema c literature reviews in social sciences and Ibero-American higher educa on. Research highlighted its poten al for mapping, summarizing, and tracking empirical evidence on so skills and knowledge management (KM) prac ce within digitally transforming academic institutions environments [33], [34].

This phase emphasized the need to standardize screening processes using clearer inclusion and exclusion criteria, thereby enhancing the reliability of findings and reducing researcher bias [35]. Progress was also noted in using PRISMA as a framework for examining social competencies in higher education, identifying thematic clusters such as leadership, collaboration, and self-directed learning [36], [37].

Research from 2021–2022 contributed to evolving the traditional PRISMA model toward interdisciplinary approaches, incorporating digital text-mining tools and quantitative analysis to trace conceptual shifts in Ibero-American higher education [38], [39]. Collectively, these contributions established the methodological foundation for subsequent expansion into more complex and comparative studies.

In recent years, PRISMA applications have evolved toward more systematic and technology-enhanced implementations, integrating software such as VOSviewer, R-Bibliometrix, and Covidence to improve review processes and data analysis [40], [41]. These tools have enabled Latin American researchers to conduct larger-scale reviews on the interrelationships among soft skills, employability, and knowledge management, strengthening the evidence base regarding the impact of university education on social innovation [42].

Contemporary literature highlights that the PRISMA framework not only ensures transparency but also provides a replicable system for generating scientometric data and conducting thematic trend analysis [43]. Through PRISMA-based systematic reviews, co-authorship networks and research clusters have been identified, evidencing the convergence of transversal competencies and institutional knowledge management in Ibero-American universities [44].

Similarly, studies in this period have incorporated expanded versions of the PRISMA model, such as PRISMA-ScR and PRISMA-2020, applied to evaluating educational impact and mapping active methodologies in hybrid learning contexts [45], [46]. These advances reflect a trend toward meta-educational research, where the combination of systematic review, bibliometric analysis, and knowledge management helps identify patterns, theoretical gaps, and innovation opportunities in Ibero-American higher education [47].

This study aims to answer the question: How does bibliometric analysis help identify the challenges and trends in soft skills and knowledge management in Ibero-American university education, with a focus on employability and social innovation? The following hypothesis is proposed:

H1: The analysis of term co-occurrence networks enables the identification of thematic patterns, emerging challenges, and trends regarding soft skills and knowledge management in Ibero-American university education, revealing their relationship with employability and social innovation.

Term co-occurrence analysis is a key bibliometric tool for unraveling the thematic structure of a research field. In the Ibero-American region, with its heterogeneity of social and educational contexts, this approach allows for the identification of new conceptual relationships that are emerging alongside a gap in knowledge regarding areas such as soft skills, knowledge management concepts, and their impact on higher education aimed at employability and social improvement.

The existing literature shows that there is growing interest in integrating essential competencies such as communica on, leadership, and collabora on into university curricula, driven by labor market demands. Furthermore, enhancing knowledge management in academic instutions is increasingly seen as a pathway to fostering innova on in both teaching and organizational practices.

In this context, the co-occurrence of terms such as so skills, tacit knowledge, collabora ve learning, employability, and technological change enables the forma on of semantic clusters that systema cally connect the challenges of higher education with the demands of the knowledge economy.

Additionally, bibliometric network analysis can reveal thematic clusters articulating key dimensions such as educational sustainability, social entrepreneurship, and the digitalization of learning processes. These associations not only outline current trends but also establish a priority map for Ibero-American university systems, particularly in addressing youth employability and inclusive social innovation.

Thus, the proposed hypothesis is justified, as term co-occurrence network analysis serves not only as an exploratory technique but also as an interpretative mechanism that facilitates the identification of structural challenges and strategic trends in developing competencies for employability and university transformation in the Ibero-American context.

METHODOLOGY

Document Selection

For document selection, the best practices of the PRISMA methodology were implemented (see Figure 1). Accordingly, two databases providing the majority of bibliometric measures Scopus and Web of Science were selected. Table 1 presents the search equations designed for each database. Records were retrieved in .bib format, totaling 439 articles.

Figure 1: PRISMA flow diagram

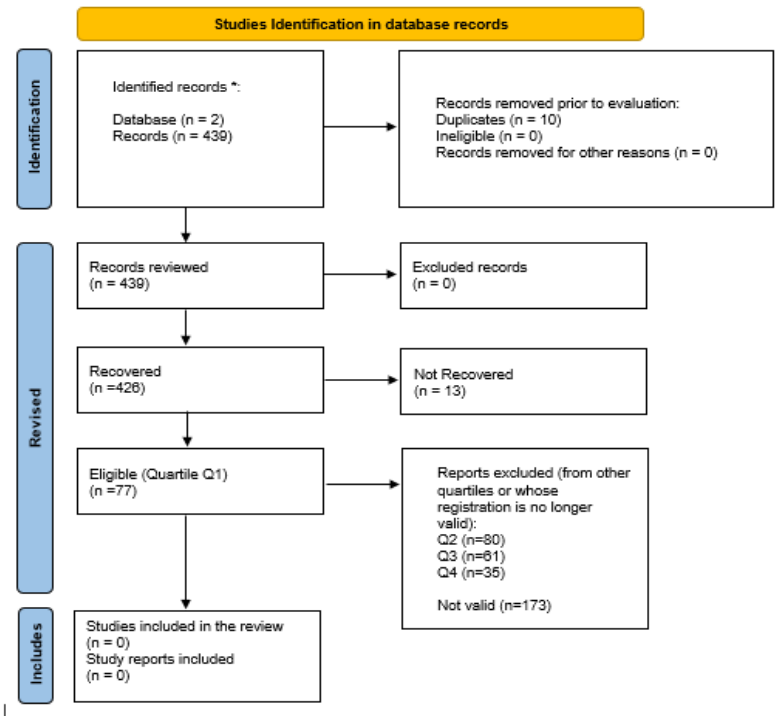


Table 1: Search equation

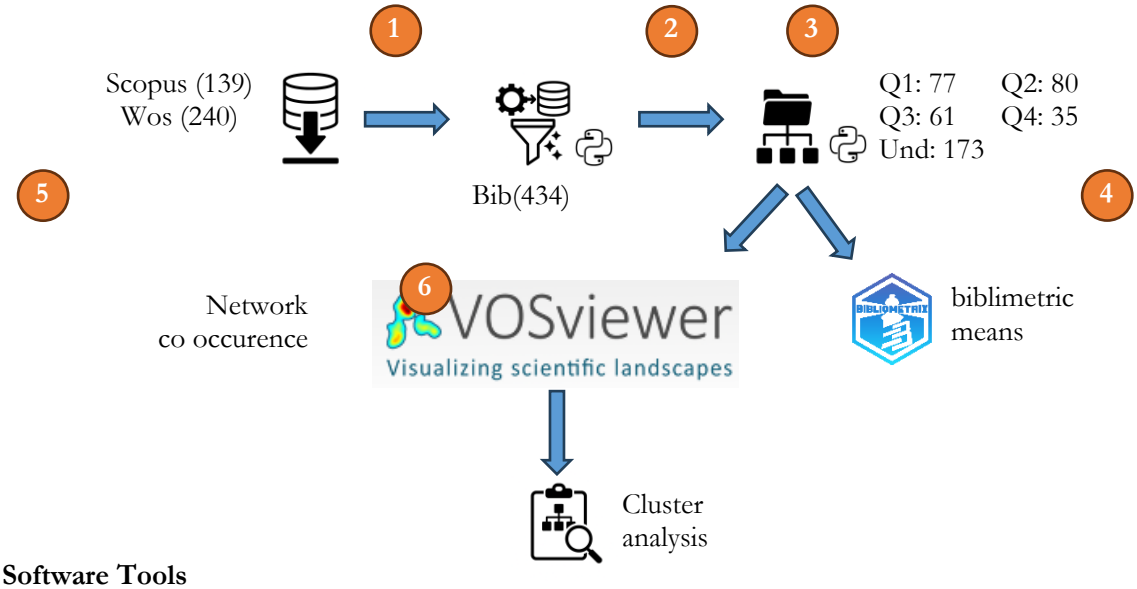
Data/base	Search equation	Total
SCOPUS	TITLE-ABS-KEY(("habilidades blandas" OR "soft skills" OR "competencias genéricas" OR "generic competencies" OR "competencias transversales" OR "transversal skills" OR "habilidades no técnicas" OR "non-technical skills") AND ("formacion universitaria" OR "educacion superior" OR "higher education" OR "university education") AND (("Ibero-America" OR "Ibero America" OR "Latinoamerica" OR "Latin America" OR "Ecuador" OR "Argentina" OR "Bolivia" OR "Brasil" OR "Brazil" OR "Chile" OR "Colombia" OR "Costa Rica" OR "Cuba" OR "Ecuador" OR "El Salvador" OR "Guatemala" OR "Honduras" OR "Mexico" OR "Nicaragua" OR "Panama" OR "Paraguay" OR "Peru" OR "Republica Dominicana" OR "Uruguay" OR "Venezuela" OR "Spanish" OR "Portugal"))) AND (LIMIT-TO (DOCTYPE,"ar"))	123
	TITLE-ABS-KEY(("knowledge management") AND ("formacion universitaria" OR "educacion superior" OR "higher education" OR "university education") AND (("Ibero-America" OR "Ibero America" OR "Latinoamerica" OR "Latin America" OR "Ecuador" OR "Argentina" OR "Bolivia" OR "Brasil" OR "Brazil" OR "Chile" OR "Colombia" OR "Costa Rica" OR "Cuba" OR "Ecuador" OR "El Salvador" OR "Guatemala" OR "Honduras" OR "Mexico" OR "Nicaragua" OR "Panama" OR "Paraguay" OR "Peru" OR "Republica Dominicana" OR "Uruguay" OR "Venezuela" OR "Spanish" OR "Portugal"))) AND (LIMIT-TO (DOCTYPE,"ar"))	76
Web of Science	("habilidades blandas" OR "soft skills" OR "competencias genéricas" OR "generic competencies" OR "competencias transversales" OR "transversal skills" OR "habilidades no técnicas" OR "non-technical skills") (All Fields) And ("formación universitaria" OR "educación superior" OR "higher education" OR "university education") (All Fields) And ("Latinoamerica" OR "Latin America" OR "Ecuador" OR "Argentina" OR "Bolivia" OR "Brasil" OR "Chile" OR "Colombia" OR "Costa Rica" OR "Cuba" OR "Ecuador" OR "El Salvador" OR "Guatemala" OR "Honduras" OR "Mexico" OR "Nicaragua" OR "Panama" OR "Paraguay" OR "Peru" OR "Republica Dominicana" OR "Uruguay" OR "Venezuela") (All Fields) Document Types : Articles	97
	("knowledge management") (All Fields) And ("formación universitaria" OR "educación superior" OR "higher education" OR "university education") (All Fields) And ("Latinoamerica" OR "Latin America" OR "Ecuador" OR "Argentina" OR "Bolivia" OR "Brasil" OR "Chile" OR "Colombia" OR "Costa Rica" OR "Cuba" OR "Ecuador" OR "El Salvador" OR "Guatemala" OR "Honduras" OR "Mexico" OR "Nicaragua" OR "Panama" OR "Paraguay" OR "Peru" OR "Republica Dominicana" OR "Uruguay" OR "Venezuela") (All Fields) Document Types : Articles	143
	Summary	439

Bibliometric Analysis

The bibliometric analysis was conducted following the workflow outlined below (see also Figure 2):

1. Articles were downloaded from the Scopus and Web of Science databases in .bib format, resulting in a total of 439 articles.
2. A Python script was developed to clean the records and remove duplicates, resulting in a refined set of 434 articles.
3. To classify the articles according to the journal quartiles in which they were published, a Python script was used. This process identified 77 articles published in Q1 (first quartile) journals.
4. Using the software tool Biblioshiny, the web interface of the R package Bibliometrix (version 5.0), the bibliometric measures for analyzing trends in the research topic were determined.
5. The software tool VOSviewer (version 1.6.20) was used to process the network of conceptual terms defined by the authors.
6. From the term co-occurrence network, the four clusters demonstrating the strongest relationships between terms were extracted.

Figure 2: Workflow



Software Tools

The present bibliometric analysis required the following software programs, listed in the table below:

Table 1: List of Software Used

Tool and Version	Description of Use
Biblioshiny from the Bibliometrix Package Version 5.1.0	Obtaining the bibliometric measures for the document corpus
VOSviewer Version 1.6.20	Generating the term co-occurrence network

RESULTS

Analysis of Bibliometric Measures Trends

The bibliometric analysis of the corpus, comprising 65 documents published between 2008 and 2025 (see Figure 3), reveals a dynamic of sustained growth in scientific production in the area, with an annual growth rate of 17.27% (see Figure 4A), distributed across 46 journals (see Figure 4B). This expansion suggests a progressive interest in the field of study, despite the moderate size of the document set.

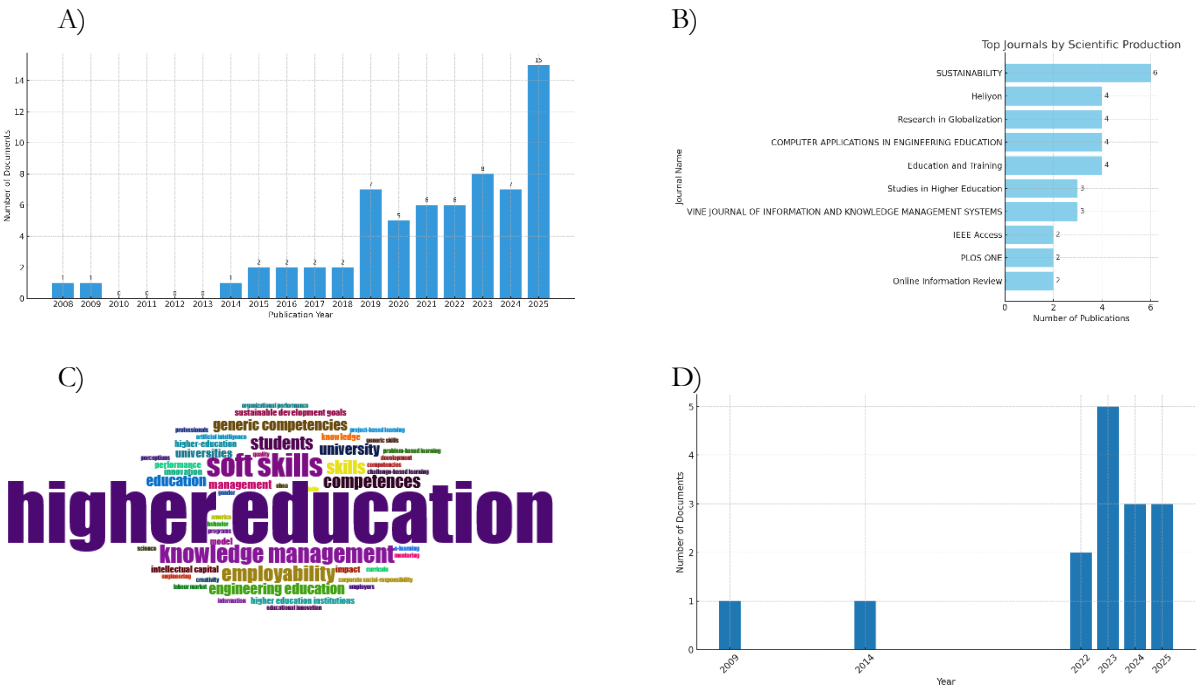
From a content perspective, the documents present a substantial set of key concepts: 194 terms were identified under the "Keywords Plus" category (extracted from the bibliographic context) and 380 keywords were defined by the authors (see Figure 4C), reflecting considerable terminological and thematic richness. This breadth suggests an active research field with expanding conceptual boundaries. Regarding authorship, 247 unique authors were identified (see Figure 4D). The average number of co-authors per document is 3.88.

Finally, the total number of cited bibliographic references amounts to 2,523, suggesting an average of approximately 38.8 references per document, a value consistent with current academic standards for peer-reviewed publications.

Table 2: Bibliometric Measures

Periodo 2008:2025	Fuentes 46	Artículos 77	Ratio de crecimiento 17,27%
Autores 247	Un solo Autor 2	CoAutor Internacional 7,17	CoAutor por Doc 4,19
Keyword 380	Referencias 2523	Publicación Anual 3,93	Ratio citación 11,42

Table 3: Bibliometric trends



A) Annual scientific production. B) Top Journals by Scientific Production. C) WordCloud. D) Scientific Production by Year (Top Authors).

Term Co-occurrence Network

Based on the 380 conceptual terms defined by the 247 authors, a term co-occurrence network was designed using VOSviewer software (see Figure 5). Four clusters, which concentrate the strongest relationships among the conceptual terms, were extracted. Cluster 1 is named: University Education Oriented Towards Employability and Labor Integration. Cluster 2 is named: Territorial Innovation and Digital Capabilities in Higher Education. Cluster 3 is named: Critical Education, Social Justice and Open Policies in Professional Training. Cluster 4 is named: Organizational Culture, Leadership and Knowledge Behavior. A definition for each cluster, along with its corresponding systematic literature review, is developed below.

Cluster 1: University Education Oriented Towards Employability and Labor Integration

Cluster 1, identified in the bibliometric analysis, groups research addressing the relationship between university education, employability, and labor integration as structuring axes of educational quality in Ibero-America (see Figure 4A). During the initial years of the analyzed period, Ibero-American research began identifying a growing concern about the gap between university training and labor market demands. Several studies showed that employability must be understood beyond immediate job placement, incorporating holistic skills, personal attributes, and knowledge management [13], [48]. Consequently, universities faced the challenge of adapting their curricula to align with rapid changes in work methods. The advancement of Industry 4.0 created the need to update technological competencies.

Research in this area highlighted the necessity of strengthening the connection between higher education institutions and labor market actors through interactive learning methodologies, practical experiences, and initiatives involving businesses [49]. Furthermore, the literature indicated that traditional educational models focused solely on knowledge transfer were insufficient for developing soft skills such as team management, effective oral communication, and problem-solving [14], [50]. Project-based learning or service learning is dynamic techniques whose use has brought better general education to students and preparedness for real working situations.

In the last years, Ibero-American works shifted focus more inclusively without damaging the pedagogical environment of such training at universities that help students get jobs where technology, new methods of teaching, and the university's responsibility toward society exist [1]. Universities have started modifying their lessons to incorporate artificial intelligence and data analytics competence together with digital knowledge management strengthening the connection between content learned and what is demanded in practice [16].

Recent studies also reveal an increase in collaborative projects between universities and companies, incorporating curricular internships and mentorship programs designed to enhance the alignment between

academic studies and market needsl [51]. In this context, university education is seen as a dynamic process that connects employability with social innovation and educational equity, creating opportunities for vulnerable populations and strengthening local social cohesion [21].

Furthermore, studies on active learning methodologies and challenge-based approaches (e.g., Challenge-Based Learning and Design Thinking) show a positive impact on acquiring practical skills, fostering student entrepreneurship, and facilitating a smoother transition into the workforce. Currently, significant emphasis is placed on creating university spaces that support student employability, where skills assessment, career guidance, and alignment with public policies form a cohesive strategy aimed at achieving sustainable development and adapting to the evolving nature of work in the digital age [52].

Cluster 2: Territorial Innovation and Digital Capabilities in Higher Education

Cluster 2, visible in the bibliometric study, comprises works that discuss the importance of territorial innovation and the growth of digital skills in transforming higher education in Ibero-America (see Figure 4B). In the initial period under review, the literature began to highlight the role of universities as drivers of regional growth, capable of transferring knowledge, fostering social cohesion, and reducing regional disparities [13].

Studies at this stage found digitalization as a key element in enhancing the relationship between universities and their localities to allow more flexible, integrated, and effective learning environments [17], [50]. Further research of this period also spotted inadequate digital teaching competence together with missing conceptual frameworks for using technological means to provide and ensure equitable educational opportunities. rural or technologically underserved areas [5].

Research at this time also revealed a lack of digital skills for teaching and ways of understanding technology to ensure that everyone has the same educational opportunities in rural areas or places where there is little technology [14], [24]. As a result, universities began to become important centers of innovation in the area, where university education was linked to local needs, sustainability, and regional growth [53].

In recent years, research on Cluster 2 shows a shift towards the union of ready university ecosystems, where regional innovation and digital skills come together to improve sustainable growth and social inclusion [49]. Current work indicates that Ibero-American universities have used forms of total digital transformation, introducing new tools such as artificial intelligence, data analysis, blockchain, and immersive learning environments to improve education, assessment, and engagement with the outside world [15], [54].

Recent literature emphasizes the role of inter-university networks and territorial innovation hubs in building a more collaborative, resilient, and socially impact-oriented higher education system [23]. These networks help share knowledge among schools, governments, and people, strengthening social innovation and creating common value. Universities have also taken on a greater role in developing plans for the territory through projects that combine sustainability, open science, and citizen participation [9].

Current research also notes that advanced digital skills are very important for university learning. Fostering information literacy, cybersecurity, computational thinking, and digital ethics has become a central mission for universities, essential for preparing students to navigate the challenges of a rapidly evolving knowledge economy. Contemporary educational management models have consequently shifted towards data-driven, continuously evaluated approaches. The adoption of digital tools has been instrumental in enhancing institutional transparency, improving educational quality, and demonstrating the societal relevance of academic institutions [2], [14].

Cluster 3: Critical Education, Social Justice, and Open Policies in Professional Training

Cluster 3, identified in the bibliometric analysis, encompasses research that links critical education, social justice, and open policies as cross-cutting themes in the transformation of university-level professional training in Ibero-America (see Figure 4C). During the initial years of the analyzed period, academic literature began to emphasize the need to shift teaching methodologies towards more emancipatory and equitable approaches that address systemic inequalities and promote universal participation as a core principle [55].

These studies highlighted the importance of pedagogical approaches grounded in the ideas of theorists such as Freire and Giroux, while also underscoring the role of higher education as a space for dialogue, civic engagement, and social transformation [8]. Ibero-American universities, particularly in Latin America, began implementing educational programs aimed at fostering equality, cultural diversity, and equity within academia by incorporating participatory methods and service-learning into their curricula [53].

Furthermore, concepts related to open knowledge policies emerged, promoting universal access to information and governmental transparency, notably through institutional repositories, open educational resources, and open science practices [3]. These studies argued that social justice in education cannot be conceived solely as the equitable distribution of resources, but must also involve the recognition of diverse identities and the active participation of individuals in the learning process [56].

In recent years, research in Cluster 3 has evolved towards a broader and more inclusive perspective on critical education, addressing social justice, gender equality, and cultural diversity as foundational pillars for human development and a sustainable university system [4], [31]. Current studies show that Ibero-American universities have begun to implement institutional frameworks that integrate education with human rights, equal opportunity, and professional ethics [57].

Recent literature documents a growth in pedagogical practices focused on student empowerment, the co-creation of knowledge, and active involvement in open learning communities [7]. This way of working has helped to strengthen academic networks and movements within the university that combine study, outreach, and teaching under the idea of equal rights to knowledge and social care [4].

Significant progress has also been made in establishing clear policies in higher education that promote transparency, collaboration, and the collective production of knowledge through digital platforms and open-access repositories [12], [28]. These policies have democratized access to education by breaking down exclusionary barriers and encouraging the equitable sharing of knowledge at both local and global levels.

The most recent inquiries also link critical pedagogy with educational innovation, strongly emphasizing the importance of interdisciplinary methods and active learning strategies such as dialogic and collaborative learning, as well as community-based, experiential learning [11]. In this context, critical education is firmly established as a model for professional training capable of addressing the ethical, cultural, and technological challenges of the twenty-first century, thereby enhancing graduates' capacity to contribute to social change and educational justice [50].

Cluster 4: Organizational Culture, Leadership, and Knowledge Behavior

Cluster 4, identified in the bibliometric analysis, groups research focused on the relationship between organizational culture, leadership, and knowledge behavior as strategic factors for institutional sustainability and innovation in Ibero-American higher education (see Figure 4D). In the initial years of the period under review, studies began to establish the theoretical foundations for this approach, highlighting the significant influence of values, beliefs, and leadership styles on institutional and collaborative learning dynamics [28].

Early research showed that universities with old structures had more trouble using knowledge well, while those that encouraged working together, talking across different levels, and believing in the university had newer, more creative spaces [48]. Similarly, it was emphasized that the way of working at the university should be geared toward openness and constant change, encouraging learning together and the participation of teachers in innovative educational activities [51].

At this time, studies also showed the role of leadership that changes things as an aid to change in places such as schools. Ways were found to lead groups of all kinds, allowing participation and interest in improving the work of those who are united by internal desires, letting people choose their work, and creating a common identity in the place of study [9]. This system allowed ideas about the practice of knowledge to be developed not only as a set of technical forms, but as a social and cultural path involving feelings, experiences, and shared meanings [30], [53].

In recent years, literature related to cluster 4 has shifted to a more complex and interrelated perspective, where organizational culture, leadership, and knowledge behavior come together as parts of a single system that adapts toward innovation and longevity in the firm [4]. Current analyses discuss the importance of shifting toward organizational cultures that are ready to learn, let go, and reconfigure themselves based on the effective management of group wisdom [3].

At this time, the study shows the role of shared and digital leadership, where decisions are made as a team and with data, using artificial intelligence, school analysis, and shared knowledge hubs [57]. This type of leadership, maintained with trust and clarity, has helped to reduce resistance to change and strengthen the bond between different members of the university.

Recent literature also addresses the emo onal dimension of leadership, examining the empathy, effec ve communica on, and emo onal intelligence has also been growing in strengthening academic communities [15]. Simultaneously, a closer link has been emerging between academic leadership and organiza onal innova on institutional where the culture supports experimenta on, provides faculty autonomy, and involves broad informa on sharing [55].

Research into real-time knowledge behavior reveals an evolution towards a more proactive model, where practices such as knowledge sharing, co-creation, and cross-disciplinary collaboration become key drivers of academic excellence [10]. Furthermore, it is crucial to view organizational culture as a foundation for continuous learning, enabling universities to synthesize diverse experiences and forge robust connections between teaching, research, and institutional management [24].

Figure 3: Co-ocurrence network

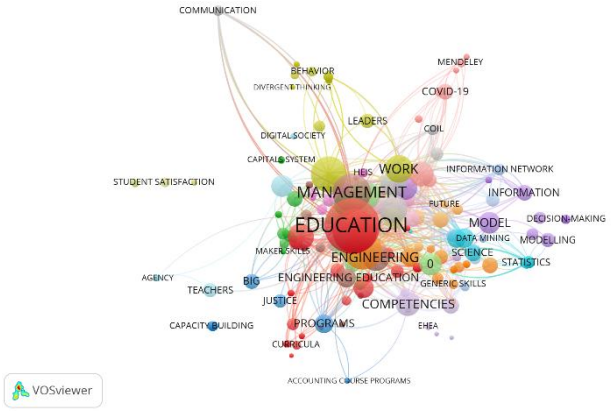
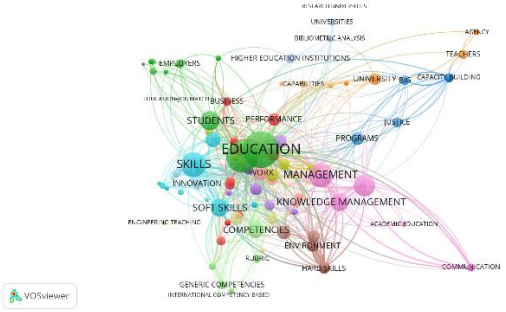
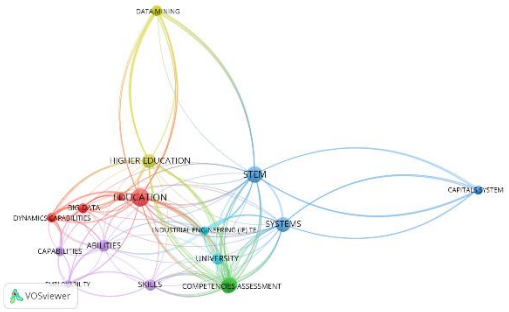


Figure 4: Clusters

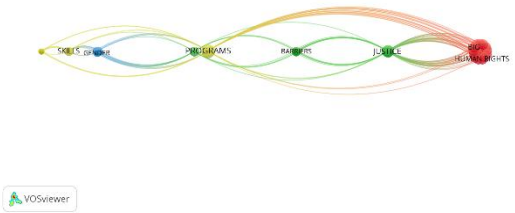
A)



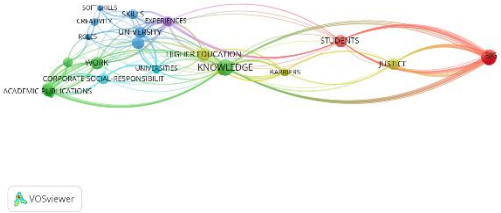
B)



C)



D)



Note: A) University education focused on employability and labor market integration. B) Territorial innovation and digital capabilities in higher education. C) Critical education, social justice, and open policies in vocational training. D) Organizational culture, leadership, and knowledge management

DISCUSSION

H1, which posits that the analysis of the term co-occurrence network makes it possible to identify thematic patterns, emerging challenges, and trends related to soft skills and knowledge management in Ibero-American higher education, demonstrates their connection to social innovation and employability. This is confirmed by the results obtained through the bibliometric analysis and this network.

The analyzed dataset of 65 publications between 2008 and 2025 revealed a coherent conceptual structure organized around four interrelated thematic clusters, which constitute the interpretive axes of the field: university employability, territorial innovation and digital capabilities, critical education and social justice, and organizational culture and academic leadership.

The co-occurrence network, from a theoretical-empirical perspective, showed that soft skills act as a node of conceptual convergence, linking simultaneously with knowledge management (Cluster 4) and with employability (Cluster 1). Communication, adaptability, and teamwork emerge as mediating variables that connect professional development with changes at the institutional and territorial levels. The presence of terms such as innovation, digital skills, leadership, and knowledge management in the main clusters supports the structural validity of the

hypothesis, showing that the themes do not appear in isolation, but are interconnected through semantic networks that reinforce their centrality within the Ibero-American field.

Furthermore, the empirical evidence confirms that the identified thematic patterns follow an evolutionary logic. During the early years of the examined period, research focused on understanding the connection between labor market integration and university education, emphasizing the redesign of curricula and the development of transversal competencies. However, more recent research (2023-2025) broadens this viewpoint towards a comprehensive perspective that merges social innovation, distributed leadership, and sustainability, thereby strengthening the synergy between territorial, organizational, and educational dimensions. The second part of the hypothesis is supported by this thematic development, as the semantic network not only recognizes simultaneous themes but also their evolution and change over time.

The identification of the clusters also allows for the inference of emerging challenges in Ibero-American university education. Among these, the following stand out:

1. The need to integrate soft skills into pedagogical models based on experiential learning and real-world problem-solving (Cluster 1).
2. The consolidation of digital and territorial ecosystems that strengthen the university-society link (Cluster 2).
3. The expansion of critical and social justice approaches that connect professional training with equity, diversity, and human rights (Cluster 3).
4. The transformation of organizational culture towards structures of collaborative leadership and shared knowledge management (Cluster 4).

These four patterns are not independent; rather, they constitute a relational system in which knowledge management acts as an integrating mechanism. The co-occurrence of terms around concepts such as open education, digital transformation, social innovation, and organizational learning demonstrates that Ibero-American universities are transitioning towards a logic of continuous institutional learning, whereby knowledge is produced, circulated, and applied collaboratively.

From a methodological standpoint, the network constructed using VOSviewer allowed for the visualization of these interrelationships with a high link density, suggesting a conceptual maturity of the field. The robustness of the semantic associations supports the hypothesis that co-occurrence analysis constitutes a valid tool for detecting thematic patterns and directions of evolution in scientific production. Thus, the convergence among the clusters shows that Ibero-American research on higher education has evolved from a fragmented perspective (focused solely on skills or leadership) towards a model of cognitive interdependence among pedagogical, technological, and organizational dimensions.

Furthermore, the empirical validation of the hypothesis is also evidenced by the correspondence between quantitative and qualitative findings. The sustained annual growth rate of 17.27% in scientific production and the participation of 247 distinct authors demonstrate the consolidation of an active academic community that addresses soft skills and knowledge management as cross-cutting axes of university innovation. This trend corroborates that the subject is in a stage of conceptual expansion, which is consistent with global frameworks of educational sustainability and digital transformation.

Finally, the findings allow us to conclude that hypothesis H1 is fully confirmed: the co-occurrence study not only made it possible to identify clearly distinct thematic patterns but also to expose the dynamic connection between knowledge management, soft skills, social innovation, and employability. This convergence reconfigures the understanding of the role of the Ibero-American university as a space for creating human, intellectual, and social capital, where knowledge is transformed into a strategic tool to drive and foster sustainable development.

CONCLUSIONS

The current study shows that scientific creation in a group of Spanish-speaking countries has reached an advanced level of theoretical and practical consolidation. Through bibliometric analysis and co-occurrence networks, it was possible to identify four interconnected clusters of themes: university employability, territorial innovation and digital skills, critical education and social justice, and organizational culture and academic leadership, which explain changes and growth in the area.

The results show that Ibero-American universities are shifting towards forms of comprehensive learning and follow-up, where non-technical skills such as leadership, communication, teamwork, and change are an important part of academic knowledge and the possibility of stable employment. This idea is linked to a new change in higher education, where information management is no longer just an administrative task but a key element in a new way of thinking, learning within the organization, and improving the territory.

In addition, the research points out that social innovation and digital transformation work together to change the role of the university in Latin American society. The results show that steps toward digitization, using new technologies, and creating ecosystems that work together help improve the relationship between universities and society; they also increase the ability to have a social and economic impact.

The study of several groups shows that interesting and fair teaching slowly achieves its objectives, leading to job training that promotes equality and acceptance of different cultures. This trend strengthens the university as part of the process of change in society, committed to human values and sustainability in education.

Overall, the results fully support the idea presented (H1), showing that word co-occurrence is a good tool for identifying thematic patterns, new trends, and important connections between soft skills, knowledge management, employability, and social innovation. It proves that the field of study has shifted from descriptive approaches to a unified talent model, where cooperation between different disciplines, transparency, and intelligent organizational culture are strong foundations for university sustainability in Ibero-America.

For this reason, this study helps to strengthen the idea of the university's place as a center of knowledge and a driver of lasting human growth, where the effective management of soft skills and shared knowledge are essential tools for addressing the challenges of Industry 4.0, global integration, and changes in today's education system.

With the discoveries made, there are many gaps to be filled with further studies and new ways to advance our knowledge.:

- Integration of mixed methods and meta-research. The combined application of longitudinal empirical studies and bibliometric analyses is recommended to measure the true effect of soft skills on learning outcomes and employability. Merging qualitative approaches, such as interviews and case studies, with quantitative approaches, such as citation analysis and co-occurrence networks, will enable a more comprehensive understanding of the phenomenon.
- Evaluation of university digital maturity. Future research could examine benchmarking models for knowledge management and technological maturity in Ibero-American universities, aiming to identify best practices in digital governance, distributed leadership, and technological sustainability.
- Analysis of academic and emotional leadership. Recent literature suggests a direct relationship between empathetic leadership, organizational culture, and institutional learning. It is proposed to deepen the study of the socio-emotional competencies of university leadership and their influence on educational innovation and institutional cohesion.
- Development of social and cognitive impact indicators. There is a need to construct integrated metrics that allow for the measurement of how knowledge management and soft skills impact equity, inclusion, and the creation of social value, incorporating dimensions of sustainability and university responsibility.
- Inter-regional and transdisciplinary comparative studies. The diversity of contexts within Ibero-America demands research that contrasts the implementation of comprehensive training models across regions and disciplines, especially in STEM areas and the humanities, where gaps in soft competencies still persist.
- Expansion of PRISMA methodologies and bibliometric tools. It is proposed to strengthen methodological rigor through the combined use of PRISMA-2020, R-Bibliometrix, and VOSviewer to map emerging thematic trends and co-authorship networks on a regional scale.

In short, future research should focus on building an Ibero-American model of university education based on knowledge and human skills, capable of integrating innovation, social justice, and institutional sustainability. Such an approach will not only enable universities to respond to the demands of the labor market, but also position them as spaces for value creation, critical citizenship, and cultural transformation.

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