

Innovation and Knowledge Management (IKM) in Higher Education: A Crucial Bibliometric Analysis for the Time Frame 1997–2024

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Abstract

This study aims to map the evolution of the subject and the studies conducted on innovation and knowledge management (IKM) in higher education, specifically. The study aims to present a systematic summary of the existing literature using bibliometric analysis within the scope of quantitative data to the attention of researchers and to identify study trends and gaps related to the concept. The unit of analysis is the bibliometric data of different types of works scanned in the Web of Science database and published between 1997-2024. When we look at the distribution of 942 documents related to IKM in higher education according to their publication years, it is seen that there is the highest concentration in 2018 (294 works), 2019 (77 works), and 2020 (74 works). The names that produced the most works are Umar Farooq Sahibzada, Khawaja Fawad Latif and Francisco J. Garcia-Penalvo; The publication type is mostly journal articles (535) and proceeding papers (380), and the distribution of publications by country is led by publishers from the USA (318), England (251), and Spain (164); works are primarily in English (828), followed by Spanish (83), Portuguese (15) and Chinese (8). When the most frequently used keywords in publications related to IKM in higher education are examined, the expressions knowledge management with 451 occurrences, innovation with 62 occurrences, and knowledge sharing with 54 occurrences are the leading ones.

Keywords

Knowledge Management, Knowledge Management Processes, Higher Education Institutions, Organizational performance, Intellectual Capital, Sustainable Education

1. Introduction

It has been known since ancient times how valuable knowledge is. The development of societies is related to how knowledgeable individuals are. For this reason, knowledge management is as important as knowledge itself. Knowledge management provides the basis for obtaining knowledge, developing new ideas, and building on this knowledge [1]. The complexity of innovation has increased with the increasing amount of information available. Innovation is related to the accessibility of information. Therefore, the complexity created by the growing accessibility of information must be managed well to ensure successful innovation [2]. Knowledge Management attaches importance to developing relevant strategies to increase an organisation's overall performance using its goals and intellectual resources [3]. When the experiences of developing countries in areas such as economy and development are examined, it is seen that universities have made great contributions [4]. Knowledge sharing is one of the most important factors supporting competitive advantage and increasing innovation [5]. Knowledge-oriented and development-oriented research universities, by dealing with the dissemination, conservation, and publication of knowledge, make a great contribution to the economy and development of the country with their publications [4]. Universities' most important non-material resource is information relevant to sustainable competitive advantage in a dynamic environment [6, 7]. In this era, Higher Education

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Institutions have gained value in adapting to significant changes in their strategies and transparency in reporting on knowledge creation and sharing [8]. Higher education is the totality of all levels covering at least four semesters. Higher education is provided at associate, undergraduate, and postgraduate levels. An associate degree is a higher education that aims to train intermediate manpower; that is, it constitutes the first stage of undergraduate education. Undergraduate is a higher education that covers at least eight semesters. Education is provided in formal, open, and distance education systems at the undergraduate level¹. Britannica states that higher education institutions include universities, colleges, and various vocational schools that prepare for law, theology, medicine, business, teacher education, music, and art².

Knowledge management in higher education includes innovation, teaching and learning skills, academic research, and publishing-related studies [9]. Knowledge management is also of great importance in universities for the production of social knowledge and contribution to educational development [9, 10]. For successful information management in organizations, especially in universities, technology, people, processes, and information are the most important basic components [11].

Knowledge, knowledge creation, and sharing aim to increase the process in which universities share with other institutions and society and improve the academicians' experience with concepts and practices. In addition, it is an important process that allows academicians to gain experience and knowledge from each other [11, 12]. For this reason, they connect people and technologies to encourage knowledge sharing, innovation, and new applications. Higher education institutions can develop a knowledge management culture with strategies related to research, internationalization, knowledge production, and model development [13]. Organizations that value knowledge facilitate the excellent characteristics of their employees, revealing their managerial, strategic, and innovative aspects as well as their storage, reuse, and updating of knowledge. Therefore, higher education institutions should develop a research-oriented curriculum for faculty members and students and update these curricula innovatively [14, 15]. Moreover, it cannot be ignored that information management will significantly contribute to creating sustainable strategies and plans and efficient processes in universities [16, 17]. Other studies also show that effective knowledge management and knowledge management practices implemented and presented in educational environments significantly contribute to innovation, competition, and education quality [9]. A greater focus on knowledge management by universities is key to creating more advanced collaboration [18].

This bibliometric study on Innovation and Knowledge Management (IKM) in higher education will make an important contribution to the literature. No bibliometric study uses Innovation and Knowledge Management (IKM) in higher education, so this study is thought to make an important contribution. Thus, it will be seen how much knowledge management contributes to higher education.

In addition, this study provides researchers with access to the most popular keywords about IKM, thus shedding light on new studies that need to be conducted in this field. The distribution of studies according to publication year and citation times not only supports the issue of which journals can be published in the relevant field but also shows the importance of the research by showing which countries have conducted the most studies.

2. Method

The bibliometric analysis method was employed in this study to provide a comprehensive view of “Innovation and knowledge management in higher education”. The central research question that guided this study is of significant importance: What are the global research trends on “Innovation and knowledge management in higher education”? Bibliometric analysis was utilised, a research method that aims to answer this question by presenting global research trends on a particular topic based on publications indexed in databases such as WoS and Scopus³. The study determined the most trending

¹OSYM- Tanımlar <https://www.osym.gov.tr/TR,1371/tanimlar.html>

²Encyclopedia Britannica: Higher Education <https://www.britannica.com/topic/higher-education>

³Visualizing scientific landscapes <https://www.vosviewer.com>

topics in the literature on “Innovation and knowledge management in higher education”, the most cited researchers and their studies, the countries that produce the most publications, and the sources with the most scientific studies.

This study chose the VOSviewer tool for its advanced capabilities in data sets, mapping, visualization, and multi-dimensional analyses.

The Web of Science (WoS) database, known for its comprehensive and reliable studies, was selected to obtain the data set. The WoS database contains a data collection covering different disciplines. WoS, together with Clarivate Analytics, includes journals with high-impact factors. It provides a large dataset from many fields, covering important trend studies in higher education and innovation and knowledge management, and provides a reliable citation network with a comprehensive evaluation process and an independent and consistent indexing system. The research was conducted on August 4, 2024, with the keyword combination "Knowledge Management" (Topic) and "Innovation" OR "Technologies" (Topic) and "higher education" OR "HEI" OR "university" OR "post-graduate" OR "graduate" (Topic). Of the 944 documents obtained without any filtering, 942 were included in the study. 2 publications were excluded from the analysis because they were retracted.

3. Results

This section shows 942 indexed studies on “Innovation and knowledge management in higher education” scanned in the WOS database between 1997 and 2024 according to their years, citation times, document types, and indexes. In addition, citation (source, document, author, country) and co-occurrence (all keywords) analyses were performed with the data set, and the results were visualised and interpreted.

3.1. Distribution of studies according to publication year and citation times

The distribution of all-time studies obtained from the database regarding publication year and citation rates is in the figure below.

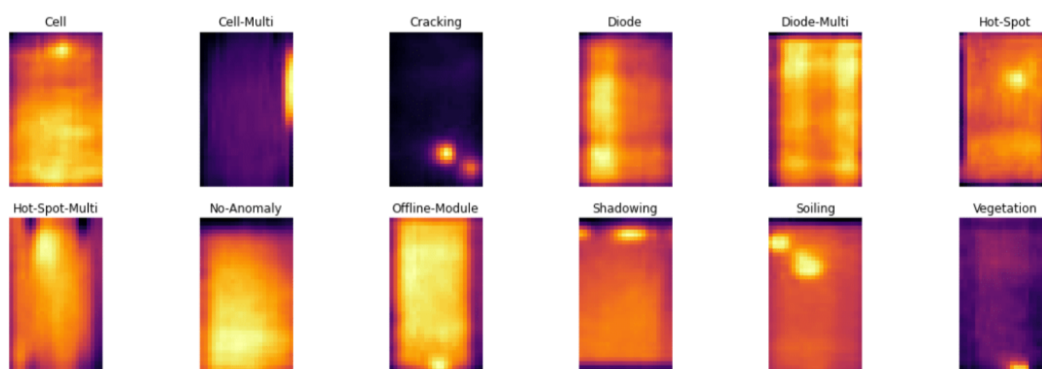


Figure 1: Times Cited and Publications Over Time of IKM in HEI

As seen in Figure 1, the first study on “Innovation and knowledge management in higher education” was published in 1997 ($n = 1$). Studies on this topic mainly started after 2003 ($n = 13$). In addition, the citation rates of the publications are parallel to the number of publications.

3.2. Distribution of studies according to document type, language, and WoS indexes

Table 1 presents the findings regarding the document types of publications on the subject at all times.

As can be seen in the table, journal articles and proceeding papers constitute the vast majority of publications.

As Table 2 shows, most of the studies on IKM in higher education indexed in the WoS database were published in English (87.8%) and Spanish (8.8%).

Table 1

Frequency and percentage of document types

Document Types	n	% of 942
Article	535	56.794
Proceeding Paper	380	40.340
Review Article	26	2.760
Book Chapters	13	1.380
Editorial Material	7	0.743
Early Access	6	0.637

Table 2

Frequency and percentage of languages of documents

Language	Frequency	Percentage
English	828	87.898%
Spanish	83	8.811%
Portuguese	15	1.592%
Chinese	8	0.849%
Russian	3	0.318%
French	1	0.106%
Italian	1	0.106%
Latvian	1	0.106%
Polish	1	0.106%
Turkish	1	0.106%

When the index types of the publications obtained from the data set are examined, the following are “Emerging Sources Citation Index (ESCI)” 303, “Conference Proceedings Citation Index – Social Science & Humanities” (CPCI-SSH) 263, “Social Sciences Citation Index” (SSCI) 218, “Conference Proceedings Citation Index – Science” (CPCI-S) 171, “Science Citation Index Expanded” (SCI-EXPANDED) 104, “Book Citation Index – Social Sciences & Humanities” (BKCI-SSH) 11, “Arts & Humanities Citation Index” (A&HCI) 5, and “Book Citation Index – Science” (BKCI-S) 3.

3.3. Co-occurrence of All Keywords

In studies on knowledge management and innovation in higher education, the most preferred keyword by researchers was determined as “knowledge management” (451 times). Other keywords used most by researchers in their studies were “higher education” (451), “innovation” (62) and “knowledge sharing” (54), respectively. The strongest expressions in terms of total link strength were determined as “knowledge management”, “higher education”, and “innovation” as a result of the analyses performed with 2487 observation units that were seen at least five times and had relationships, a total of 11 clusters, 479 links, and 1157 total link strengths were determined.

Figure 2 shows the all-time trends of the most used keywords over time. After 2020, the most popular keywords in the field of knowledge management and innovation in higher education are “Higher Education Institutions”, “Knowledge Management Process”, “organizational performance”, “trust”, and “university-industry collaboration” (Table 3).

3.4. The Most Cited Innovation and Knowledge Management in Higher Education Articles

The number of citations to a publication indicates its importance [19]. The network mapping was performed to determine the citation counts of documents; documents that received more than 30 citations were included in the citation-documents analysis. Only 73 of 942 documents meet the thresholds. Figure

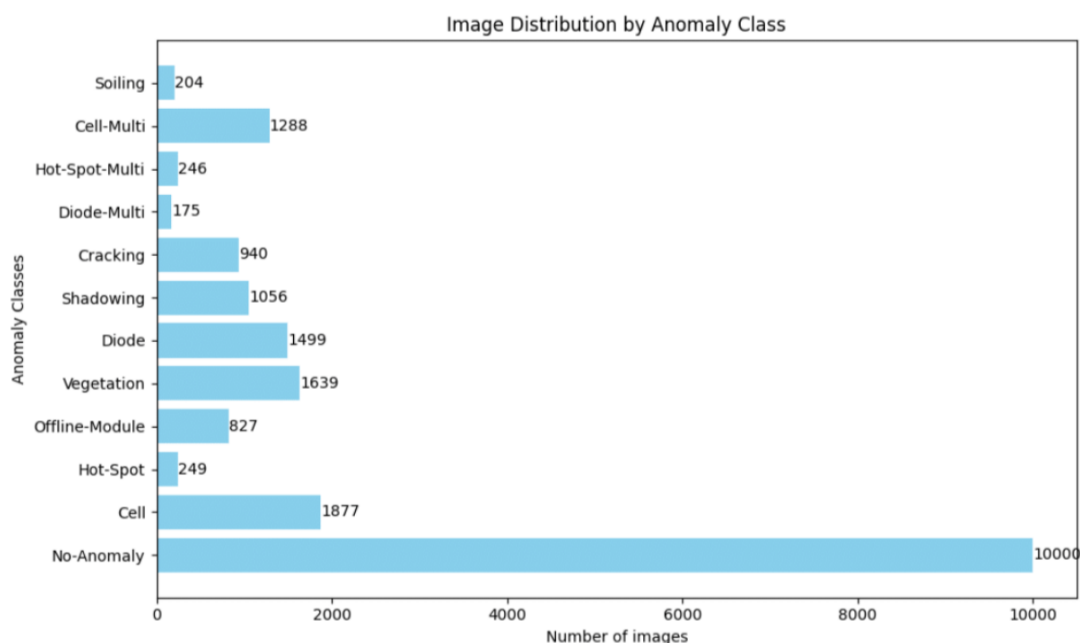


Figure 2: Overlay Visualisation of used mostly keywords

Table 3

Most popular keywords used in 2020-2024 years

Keyword	Occurrences	Total Link Strength
Higher Education Institutions	20	35
Knowledge Management Processes	12	22
Organizational Performance	11	20
Trust	9	14
University-industry collaboration	9	17
Sustainability	7	9
Artificial Intelligence	6	8
Knowledge-oriented leadership	6	10
Triple Helix Model	6	10
Transformational leadership	6	10
Human capital	5	11

3 presents the network visualization of 11 papers linked to each other.

Table 4 presents the five most cited publications on “Innovation and knowledge management in higher education”. As can be seen from the findings, all five of the most cited studies are scientific journal publications. Thus, the five studies presented have left their mark in the field.

The findings, especially the study titled “From knowledge management to organisational performance: Modeling the mediating role of innovation and intellectual capital in higher education”, were read by many researchers in the field and used as a reference in their studies.

3.5. The Most Productive Authors of Innovation and Knowledge Management in Higher Education Articles

While conducting document and Citation Network analyses to determine the most productive authors, the minimum publication number criterion 5 was chosen. Figure 4 presents the most productive authors working on “Innovation and knowledge management in higher education”.

Umar Farooq Sahibzada has written ten documents on “Innovation and knowledge management in higher education,” these publications have received 415 citations. Khawaja Fawad Latif is another

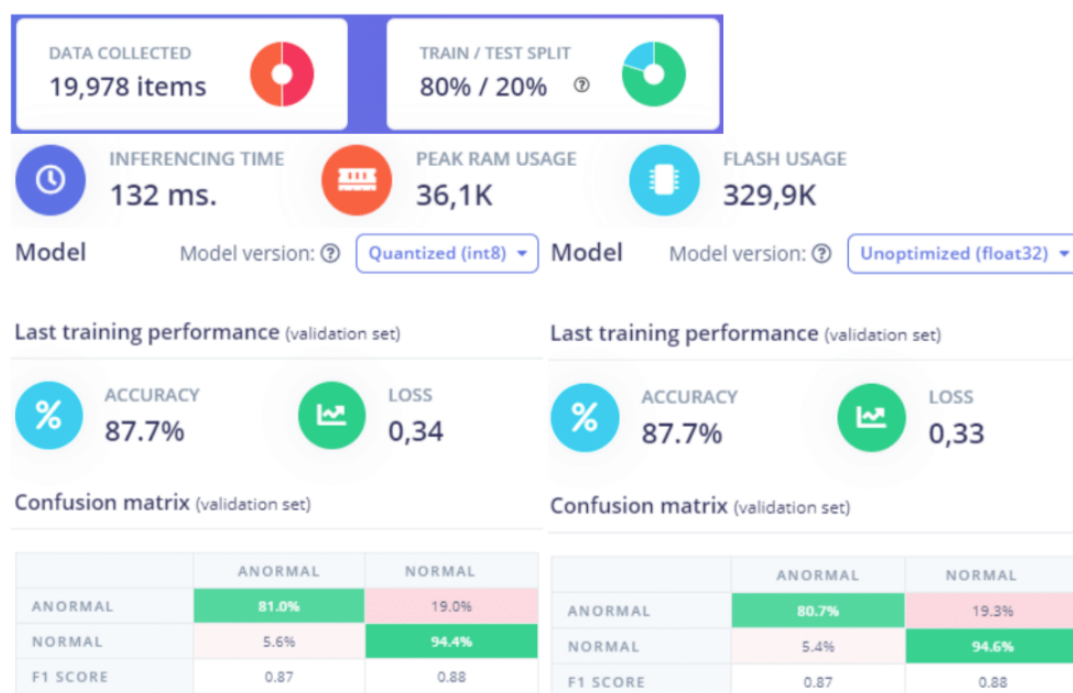


Figure 3: Most cited documents

Table 4
The Most Cited Articles

Rank	References	Citation
1	“Iqbal, A., Latif, F., Marimon, F., Sahibzada, U. F., & Hussain, S. (2019). From knowledge management to organisational performance: Modelling the mediating role of innovation and intellectual capital in higher education. <i>Journal of Enterprise Information Management</i> , 32(1), 36-59”	153
2	“Al-Kurdi, O., El-Haddadeh, R., & Eldabi, T. (2018). Knowledge sharing in higher education institutions: a systematic review. <i>Journal of enterprise information management</i> , 31(2), 226-246”	123
3	“Al-Kurdi, O. F., El-Haddadeh, R., & Eldabi, T. (2020). The role of organisational climate in managing knowledge sharing among academics in higher education. <i>International Journal of Information Management</i> , 50, 217-227”	122
4	“Rehman, U. U., & Iqbal, A. (2020). Nexus of knowledge-oriented leadership, knowledge management, innovation and organizational performance in higher education. <i>Business Process Management Journal</i> , 26(6), 1731-1758”	69
5	“Latif, K. F., Afzal, O., Saqib, A., Sahibzada, U. F., & Alam, W. (2021). Direct and configurational paths of knowledge-oriented leadership, entrepreneurial orientation, and knowledge management processes to project success. <i>Journal of Intellectual Capital</i> , 22(1), 149-170.”	50

researcher who has contributed the most to the field. Latif has six documents with 235 citations. Francisco J. Garcia-Penalvo is in third place with five publications and 304 citations. Irina-Emily Hansen and Ola Jon Mork are among the top five authors, with five publications and 20 citations each.

3.6. Citation of Countries

To create a network map for the citations that documents receive according to their country of origin, a map was made on 60 observation units with relationships between them within the scope of the criterion of at least one published work and 1 citation being received by a country.



Figure 4: Most productive authors

Thirteen clusters, 293 links, and 851 total link strengths were identified. The countries with the most citations and documents were determined as Spain (1327 citations, 92 documents), England (1237 citations, 67 documents), and the People’s Republic of China (1105 citations, 96 documents). The ranking in terms of number of works is as follows: USA (318 publications), England (251 publications) and Spain (163 publications). The top three countries in terms of total link strength are the People’s Republic of China (302), Pakistan (261) and England (149), respectively.

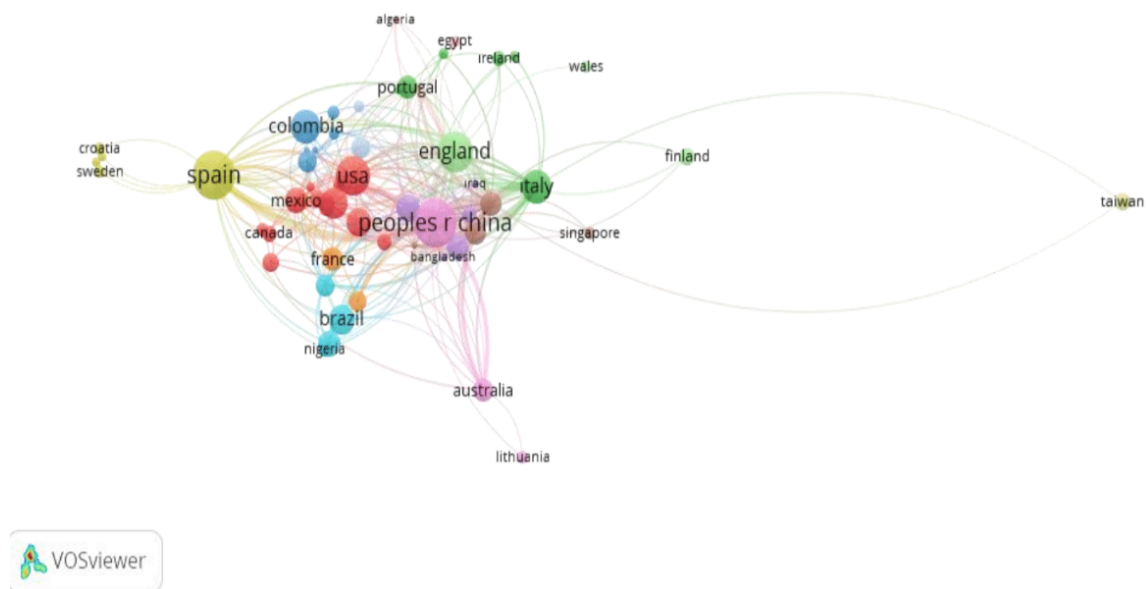


Figure 5: Citation of Countries

3.7. Source Citation Analysis

To identify journals publishing on “innovation and knowledge management in higher education” and the citation networks of these journals, a network map was created for author citation analysis with the criteria of at least five publications and at least 1 citation. In the study conducted on ten units that were seen to be connected, a total of 4 clusters, ten connections, and a total connection strength of 20 were determined. It was determined that the Journal of Knowledge Management (21 documents), Sustainability (12 documents), and Vine Journal of Information and Knowledge Management Systems (10 documents) were the journals with the most publications on the subject.

As seen in Figure 6, the most cited journals were the Journal of Knowledge Management, with 742

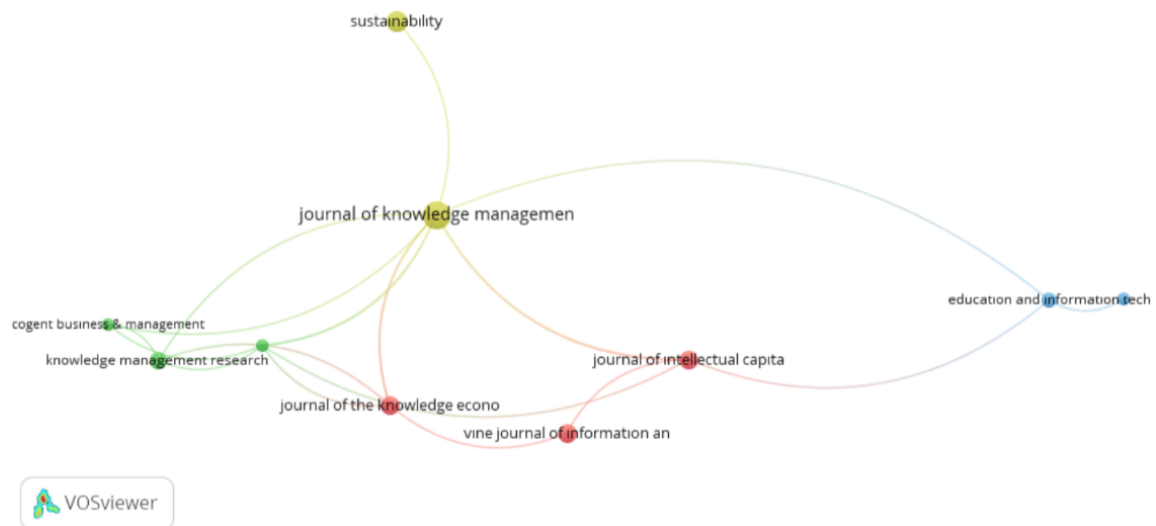


Figure 6: Most Cited Journals

citations; the Journal of Intellectual Capital, with 277 citations; and Knowledge Management Research and Practice, with 136 citations.

3.8. Co-authorship of Authors

According to the authors’ co-authorship analysis, a network map was created with studies that reveal a solid collaboration and impact network. At least one publication and threshold were made to identify the most connected and collaborating authors.

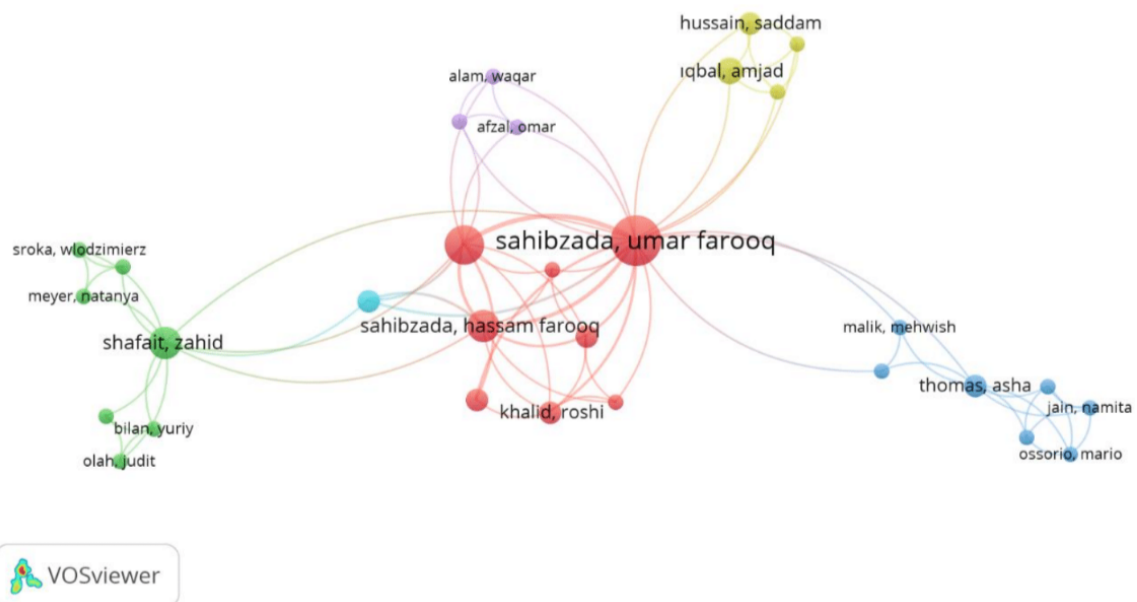


Figure 7: Co-Author Ties Demonstrating Collaboration Between Authors

According to the analysis made among the names with the highest connections, 30 names and 75 connections are seen in six different clusters, and the total link strength is calculated as 93. It is seen that the most cited author, Sahibzada Umar Farooq (19 links, 31 total link strength), is connected to at least one author in the other 5 clusters. Another author, Khawaja Fawad Latif (11 links, 20 total link strength), who authored six documents, is found to be connected to three of the other clusters. This

structure also shows us which topics they have collaborated on more.

4. Discussion and Conclusion

This study aims to examine 944 published studies on innovation and knowledge management in higher education, which were scanned in the Web of Science database. Two documents in the dataset were not included in the study due to article retracts by journal, and analyses were conducted with 942 documents. While scanning the Web of Science, the keywords "Knowledge Management", "Innovation", "Technologies", "higher education", "HEI", "university", "post-graduate", and "graduate" were selected in the Topic field and the search was performed. Although the first study on innovation and knowledge management in higher education was conducted in 1997, it became popular after 2003. It can be said that the developments in information technologies after the 2000s increased the interest in this subject. Most studies on the subject were conducted in 2019. When the most cited research conducted in 2019 was examined, it was determined that this study examined the relationship between knowledge management and the performance of universities in research universities in Pakistan. The study conducted with 217 academic and administrative staff determined that knowledge management facilitators significantly impact knowledge management processes. The results revealed that knowledge management facilitators in higher education affect institutional performance.

According to the results obtained from the analyses conducted to determine the trending topics related to innovation and knowledge management in higher education, it was determined that they are "knowledge management process", "organizational performance", "trust", "university-industry collaboration", "artificial intelligence" and "sustainability". The study conducted by Latif and her colleagues in the "knowledge management process" field in 2021 has been researched that can be given as an example of trending topics. Latif et al. (2021) aimed to determine the impact of knowledge management enablers on knowledge management processes and project success. The study revealed that entrepreneurial orientation and knowledge-oriented leadership significantly impact knowledge management processes and project success. Another study, among the trending topics conducted by Rehman and Iqbal in 2020, addressed innovation and organizational performance in higher education. Focusing on the impact of higher education institutions on organizational performance, the study concluded that knowledge-oriented leadership has a positive impact on organizational performance.

To increase organizational performance, a good knowledge management process needs to be implemented; therefore, research is being conducted on the subject. In addition, the mission of universities today is to establish good cooperation with the industry, to ensure that learners learn more effectively and to train human resources in line with the needs of the industry. In parallel with this, research has begun on the subject. In addition, all educators and researchers consider the importance of sustainable education and technologies today. To provide sustainable education, information and communication technologies should be used effectively, and the information management process should be designed most efficiently. Another trending topic is artificial intelligence, as in all other areas. Artificial intelligence has started to be used in all areas, and how to best utilize artificial intelligence in information management to benefit from the positive opportunities of artificial intelligence is among the topics that need to be investigated. When the most cited studies are examined, it is concluded that all of the top five studies are journal articles. This may suggest that publishing in peer-reviewed journals and journals indexed in WoS indexes increases the visibility of the research and contributes more to science. In the current study, it was determined that the most cited author was Umar Farooq Sahibzada. The researcher's studies have been chosen to focus on knowledge management processes for organizational performance, knowledge management facilitators, and the impact of knowledge management processes on organizational performance.

Regarding the distribution of publications by country, it was revealed that the publishers originated from the USA, England, and Spain; documents were published primarily in English and Spanish. Another result is that higher education studies on innovation and knowledge management are mostly published in the Journal of Knowledge Management, Sustainability, and Vine Journal of Information and

Knowledge Management Systems. Researchers can benefit from these journals to follow the literature on the subject and publish their studies.

In the future, researchers conducting studies on innovation and knowledge management in higher education can plan their research by considering the results obtained from this study, which can help them contribute more to the literature. In particular, researchers can easily find which studies and journals should be read first on the subject from this study.

One of the study's limitations is that the analyses conducted on publications obtained from keywords in the WoS database collection did not include internationally respected databases such as Scopus, IEEE, and Ebsco and sources that have yet to be published online. However, future studies on this subject are recommended to expand the research scope by including other important databases. According to the results of this study, systematic analysis can be performed to obtain more detailed information in future studies.

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