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Mapping Research Trends in Library and Information Science: A Bibliometric Analysis Using Publish or Perish and VOSviewer

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ABSTRACT

This study analyzes research trends in Library and Information Science using a bibliometric approach. Data were retrieved from Google Scholar through Publish or Perish using the keyword "Library and Information Science" within a selected publication period. The collected documents were examined based on publication growth, citation patterns, relative growth rate, doubling time, and keyword relationships. VOSviewer was used to generate network, overlay, and density visualizations to identify thematic patterns and relationships among keywords. The findings show changes in publication productivity over time and indicate a decline in research output in recent years. The visualization results reveal several major keyword clusters related to bibliometric analysis, LIS education, academic libraries, information literacy, artificial intelligence, and research productivity. This study provides an overview of research development and thematic structure in Library and Information Science.

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1. INTRODUCTION

Library and Information Science (LIS) has developed from a traditional discipline concerned with library organization and information services into a broader interdisciplinary field related to digital information, knowledge management, information literacy, academic libraries, research productivity, and emerging technologies. The rapid growth of digital information sources, online databases, and scholarly communication platforms has increased the volume of publications in LIS. As a result, mapping research trends in this field is important to understand how the discipline develops, what themes receive scholarly attention, and how research productivity changes over time.

Bibliometric analysis is commonly used to examine the development of research fields through publication data, citation patterns, authorship trends, keyword relationships, and research visualization. This method helps researchers identify dominant topics, influential works, publication growth, and conceptual structures within a discipline. Science mapping is also useful for understanding the intellectual, conceptual, and social structure of a research area [1]. Therefore, bibliometric analysis can provide an evidence-based overview of LIS research development.

The use of bibliometric tools has made research mapping more systematic and accessible [2,3]. Publish or Perish is widely used to retrieve publication and citation data from academic databases, including Google Scholar [4, 5]. VOSviewer is frequently used to visualize bibliometric networks, such as keyword co-occurrence, citation relationships, and thematic clusters [6-8]. Then, the combination of Publish or Perish and VOSviewer can support research mapping by producing network visualization, overlay visualization, and density visualization [4, 5]. Several bibliometric studies have applied these tools in different research areas. For example, previous research has used bibliometric analysis to examine journal performance, educational research trends, computational thinking, intelligent tutoring systems, e-learning adoption, soft computing, and COVID-19 publications [4-9]. These studies show that bibliometric mapping can reveal publication productivity, citation impact, keyword trends, and research cluster development. Such approaches are useful not only for evaluating past research but also for identifying future research directions.

Although many studies have examined bibliometric patterns in various disciplines, more focused analysis is still needed in the field of LIS. Research trends in LIS may differ depending on the database, search strategy, keyword selection, and period of analysis. A keyword-based bibliometric study can provide a specific view of how research indexed under the term “Library and Information Science” has developed. This is important because different keywords may produce different datasets and may highlight different thematic structures within the same broad field.

This study analyzes research trends related to the keyword “Library and Information Science” using a bibliometric approach. Data were retrieved from Google Scholar through Publish or Perish, and VOSviewer was used to visualize keyword relationships. The study examines publication growth, citation patterns, relative growth rate, doubling time, citation range, and keyword networks. It also presents network visualization, overlay visualization, and density visualization to show thematic patterns in LIS research.

The objectives of this study are to analyze the growth of research output related to “Library and Information Science,” examine research productivity and citation patterns, map keyword networks using VOSviewer, and provide a bibliometric profile of LIS research based on Google

Scholar data. Through this analysis, the study is expected to contribute to a clearer understanding of research development, thematic concentration, and emerging patterns in Library and Information Science.

2. METHODS

This study used a bibliometric analysis method to examine research trends related to the keyword "Library and Information Science". Bibliometric analysis was selected because it can be used to identify publication growth, citation patterns, research productivity, and keyword relationships within a specific research field. The method also allows research data to be visualized through bibliometric mapping tools.

Data were collected from Google Scholar using the Publish or Perish software. Google Scholar was selected because it provides broad coverage of scholarly documents, including journal articles, conference papers, books, and other academic publications. The keyword used in the search process was "Library and Information Science", with the publication period limited to 2015-2025. The search setting was adjusted to retrieve relevant documents, including citation information, for bibliometric analysis. The initial search produced a dataset of documents related to the selected keyword.

The collected data were analyzed based on several bibliometric indicators, including total publications, total citations, average citations per paper, relative growth rate, doubling time, and citation range. These indicators were used to examine the development of research productivity and citation impact over time. The annual distribution of publications was organized to show changes in research output during the selected period.

In addition to quantitative bibliometric indicators, this study used VOSviewer to visualize keyword relationships. VOSviewer was applied to generate three forms of visualization: network visualization, overlay visualization, and density visualization. Network visualization was used to identify clusters of related keywords, overlay visualization was used to observe thematic development over time, and density visualization was used to identify areas with high keyword concentration. This approach follows previous bibliometric studies that used Publish or Perish and VOSviewer for research mapping and visualization [4, 5].

The analysis focused on identifying publication trends, citation patterns, growth indicators, and keyword clusters in LIS research. The results are presented through tables and figures, including publication details, relative growth rate and doubling time, citation range, and VOSviewer-based visualizations. These outputs provide a bibliometric profile of research development related to LIS during the selected period.

3. RESULTS AND DISCUSSION

The analysis retrieved documents related to the keyword "Library and Information Science" from Google Scholar using Publish or Perish. The dataset covers publications from 2015 to 2025 and provides information on publication output, citation performance, relative growth rate, doubling time, citation range, and keyword visualization. Bibliometric analysis is useful for identifying publication growth, citation impact, and thematic structures within a research field, while science mapping and visualization tools can support the mapping of relationships among keywords and research themes [1,2]. The analysis shows that research on LIS experienced fluctuating publication growth during the selected period. The publication trend also indicates changes in research productivity and citation impact over time.

The publication details from 2015 to 2025 are presented in **Table 1**. The table includes total publications, cumulative publications, percentage distribution, total citations, and average citations per paper. The total number of retrieved publications was 996, with 38,384 citations. The highest annual publication output occurred in 2017 and 2021, each contributing 122 publications. The year 2015 recorded the highest total citations, while 2025 showed the highest average citations per paper. However, the high average citation value in 2025 should be interpreted carefully because the number of retrieved documents for that year was relatively small. The publication trend also shows a decline after 2021, especially in 2022, 2024, and 2025. This fluctuation is consistent with previous bibliometric studies showing that research productivity may change across periods depending on database coverage, keyword selection, and the development of research interest in a topic [3-7]. This decline may indicate either reduced publication output under the selected keyword or changes in keyword usage, indexing patterns, and retrieval coverage in Google Scholar.

Table 1. Publication details from 2015-2025.

YEAR	TP	W	P (%)	TC	ACPP
2015	120	120	12.05	6595	54.96
2016	108	228	10.84	5801	53.71
2017	122	350	12.25	4389	35.98
2018	92	442	9.24	3158	34.33
2019	103	545	10.34	3021	29.33
2020	104	649	10.44	4262	40.98
2021	122	771	12.25	3056	25.05
2022	53	824	5.32	910	17.17
2023	96	920	9.64	2028	21.13
2024	54	974	5.42	627	11.61
2025	22	996	2.21	4537	206.23
Total	**996**	**-**	**100**	**38384**	**-**

Note: TP = Total publications, W = Cumulative sum, P = Percentage, TC = Total citations, ACPP = Average citations per paper.

The annual publication trend and average citation pattern are illustrated in **Figure 1**. The figure helps show the relationship between publication productivity and average citation impact across the selected years. Publication productivity was relatively strong in the earlier period, especially in 2015, 2017, and 2021. After 2021, the number of publications declined, although citation behavior remained uneven. Publication output and citation impact do not always move in the same direction. A year with fewer publications may still show a high average citation value when a small number of documents receive substantial citations.

The relative growth rate and doubling time were calculated to examine the growth pattern of LIS research over time. **Table 2** shows that the relative growth rate generally declined during the study period, while doubling time increased. The highest relative growth rate appeared in 2016, while the lowest value was recorded in 2025. This pattern indicates that the growth of publications retrieved under the keyword “Library and Information Science” became slower over time. The increasing doubling time further confirms that the expansion of publications did not accelerate consistently. This finding supports the earlier observation that publication productivity declined in the later years of the study period.

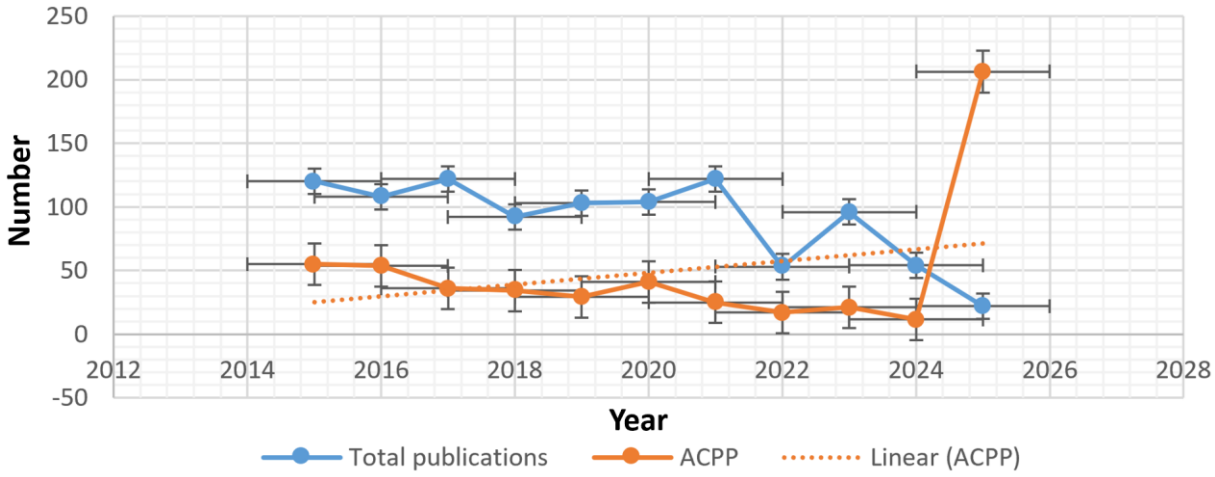

Figure 1. Year-wise distribution pattern.

Table 2. Relative growth rate and doubling time.

YEAR	TP	W	Ln W	RGR	DT
2015	120	120	4.79	-	-
2016	108	228	5.43	0.64	1.08
2017	122	350	5.86	0.43	1.62
2018	92	442	6.09	0.23	2.97
2019	103	545	6.30	0.21	3.31
2020	104	649	6.48	0.17	3.97
2021	122	771	6.65	0.17	4.02
2022	53	824	6.71	0.07	10.42
2023	96	920	6.82	0.11	6.29
2024	54	974	6.88	0.06	12.15
2025	22	996	6.90	0.02	31.03
Total	**996**	**-**	**-**	**Avg. 0.21**	**Avg. 7.69**

Note: RGR = Relative growth rate, DT = Doubling time.

The citation range pattern is presented in **Figure 2**. This figure shows how documents were distributed across different citation ranges. Most publications were concentrated in the lower citation ranges. A large number of papers received between 0 and 10 citations, followed by papers receiving between 10 and 50 citations. Only a small number of documents received very high citation counts. This pattern reflects the uneven nature of citation distribution in bibliometric data, where a small number of highly cited publications often receive a large share of total citations [3, 7]. This pattern is common in bibliometric studies because citation distribution is usually unequal, with a small number of highly cited works receiving a large proportion of total citations.

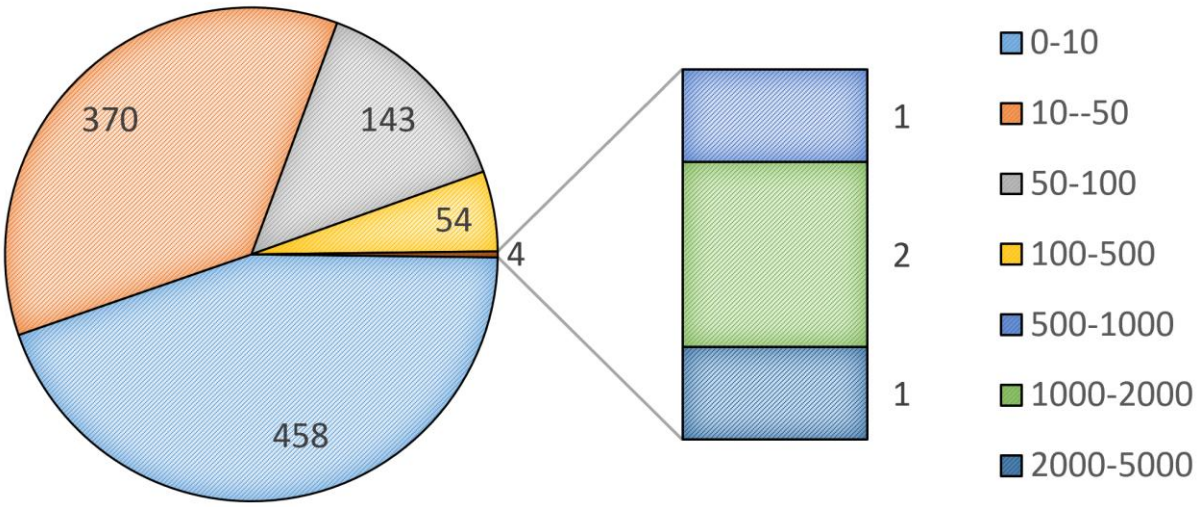

Figure 2. Citation range pattern.

The VOSviewer analysis was used to examine keyword relationships in the dataset. The visualization produced three forms: network visualization, overlay visualization, and density visualization. These visualizations help identify thematic clusters, temporal patterns, and areas of high keyword concentration. The use of VOSviewer for network, overlay, and density visualization is consistent with previous bibliometric studies that applied visualization mapping to identify keyword clusters, thematic development, and areas of research concentration [4-9]. The network visualization is presented in **Figure 3**. The analysis produced several clusters representing related research themes in LIS. The clusters include topics such as bibliometric analysis, citation analysis, LIS education, academic libraries, information literacy, information science curriculum, artificial intelligence, data science, open access, social justice, sustainability, and research productivity. LIS research is broad and interdisciplinary. It connects traditional library themes with emerging digital and social issues.

The network visualization produced nine clusters. The first cluster was related mainly to bibliometric analysis, citation analysis, research output, open access, Scopus, and information science journals. The second cluster included terms related to knowledge management, information services, curriculum, and pandemic-related issues. The third cluster emphasized academic librarians, archives, faculty members, professional development, and library information science. The fourth cluster included academic libraries, ICT, communication technology, library resources, higher education, and user satisfaction. The fifth cluster showed themes related to artificial intelligence, data science, digital humanities, innovation, and school libraries. Other clusters included themes such as LIS education, diversity, inclusion, information literacy, postgraduate students, social media, public libraries, and information science society. LIS research covers both traditional and emerging areas.

The overlay visualization is presented in **Figure 4**. This visualization helps show the development of keyword themes across time. The visualization indicates that some terms are associated with earlier research themes, while others reflect more recent developments. Topics such as bibliometric analysis, information literacy, digital humanities, artificial intelligence, sustainability, and social justice appear as important areas in the research map. The overlay visualization suggests that LIS research has expanded beyond traditional library services into digital transformation, data-related studies, educational development, and social issues. This supports the view that LIS is an evolving interdisciplinary field.

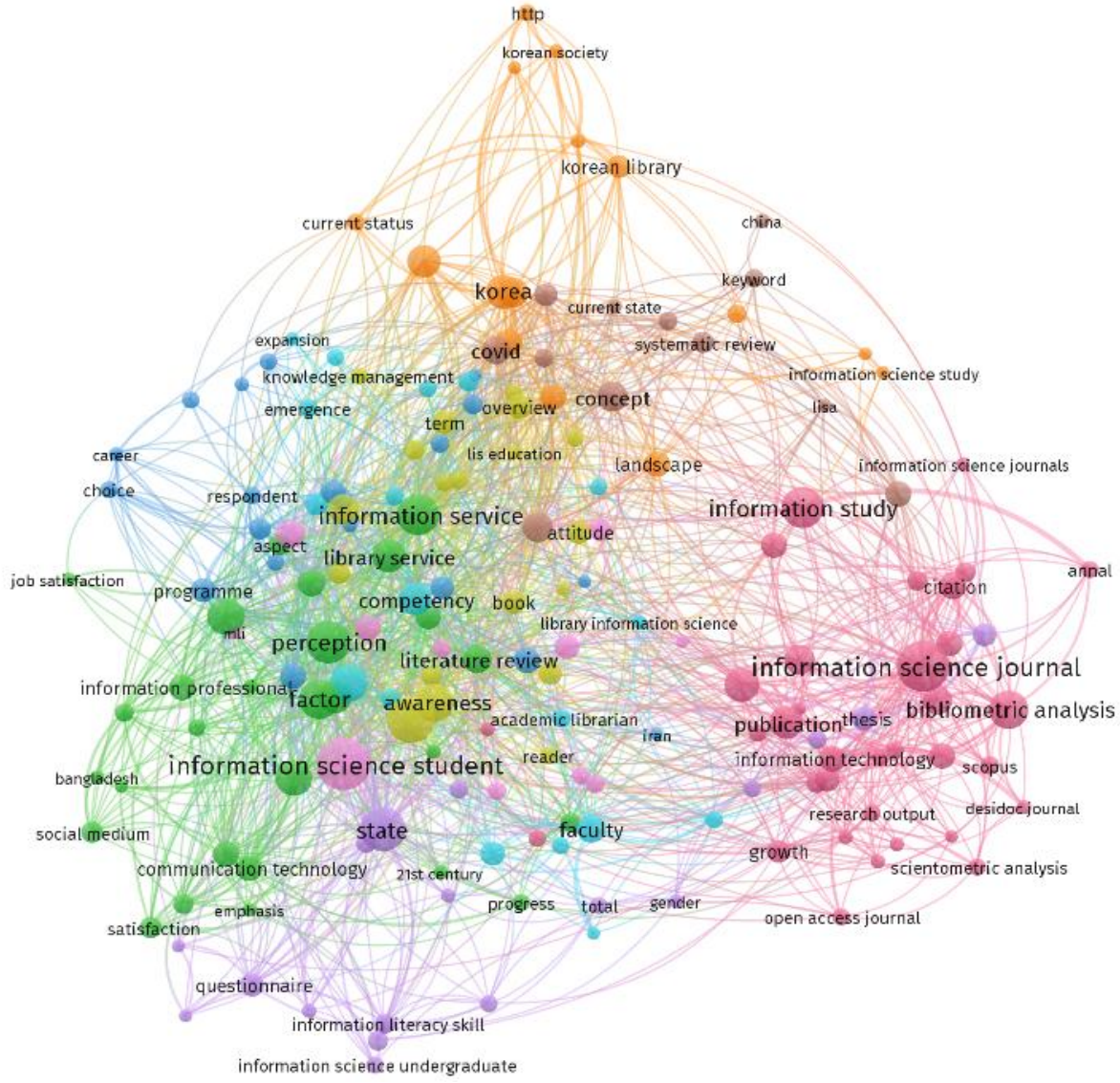

Figure 3. Network visualization.

The density visualization is presented in **Figure 5**. This figure shows the concentration of keyword relationships in the bibliometric map. Some keyword areas have higher density than others. Yellow areas indicate stronger item density and closer relationships among keywords, while green areas indicate moderate density and blue areas indicate lower density. The high-density areas suggest that certain themes appear frequently and are strongly connected in the dataset. These include bibliometric analysis, information science, library science, citation analysis, and research output. Lower-density areas represent less frequent or emerging themes that may still develop in future research. This interpretation is in line with bibliometric visualization studies showing that density maps can help identify dominant and emerging research themes within a dataset [2, 4, 5, 8, 9].

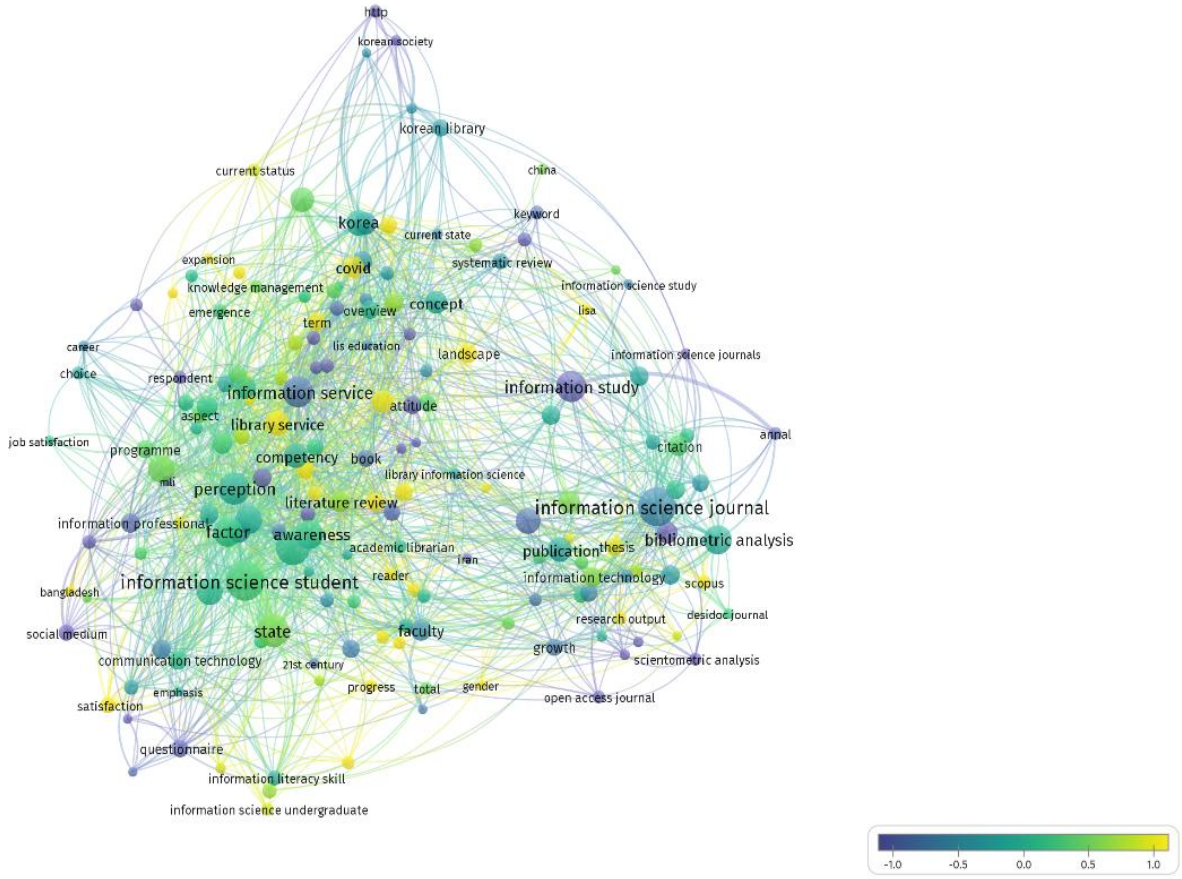

Figure 4. Overlay visualization.

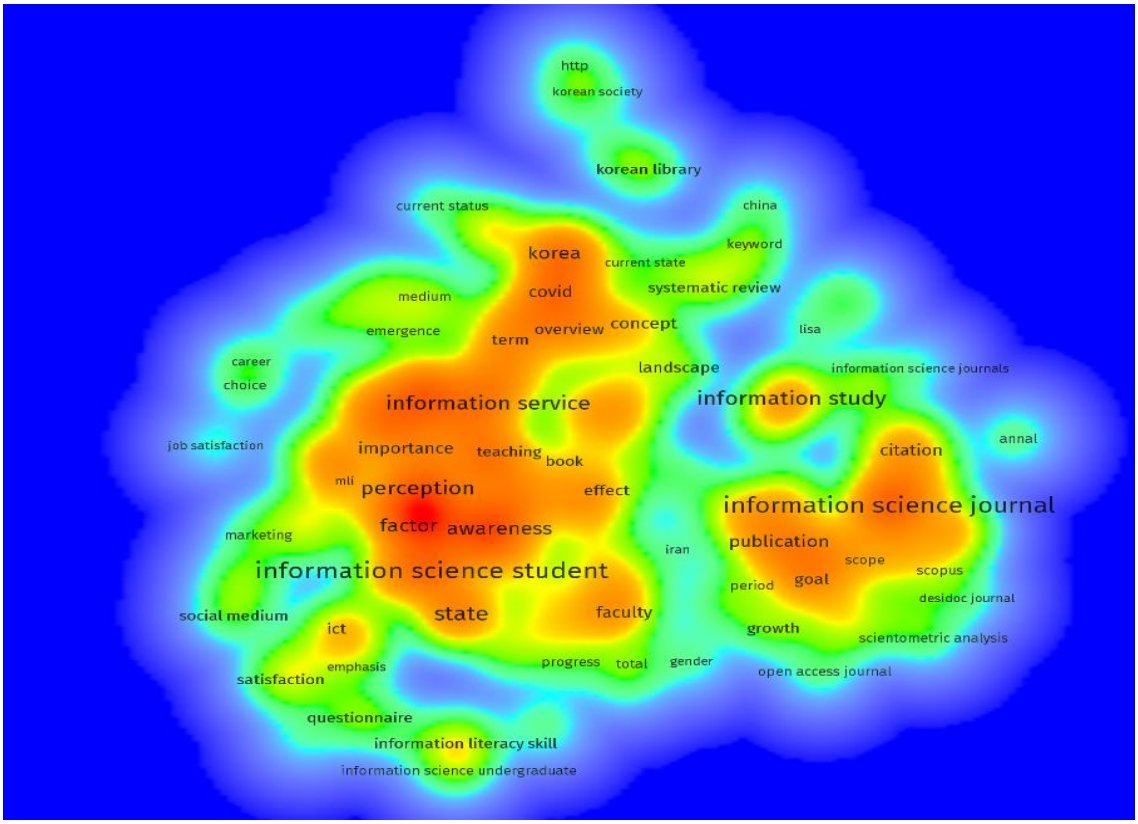

Figure 5. Density visualization.

LIS research retrieved through the selected keyword has experienced fluctuating growth from 2015 to 2025. The dataset demonstrates strong citation impact, although citation distribution is uneven. The decline in publication output after 2021 suggests a shift in research visibility, indexing, or terminology. The VOSviewer mapping shows that LIS research is organized into multiple thematic clusters, including bibliometrics, LIS education, academic libraries, information literacy, digital technologies, artificial intelligence, and research productivity. These findings indicate that bibliometric analysis using Publish or Perish and VOSviewer can provide a useful overview of publication trends and thematic structures, as also shown in previous bibliometric studies across different research areas [10-16].

4. CONCLUSION

This study concludes that research on LIS shows fluctuating publication growth during the selected period. The bibliometric analysis indicates that publication productivity was relatively strong in several years, but declined in the later period. Citation performance also varied, showing that publication output and citation impact do not always follow the same pattern. The relative growth rate and doubling time results show that the growth of publications became slower over time. Most documents were concentrated in lower citation ranges, while only a small number of publications received high citation counts. This indicates an uneven citation distribution within the dataset. The VOSviewer analysis produced network, overlay, and density visualizations that reveal several major research themes, including bibliometric analysis, citation analysis, LIS education, academic libraries, information literacy, artificial intelligence, open access, sustainability, and research productivity. These findings show that LIS is an interdisciplinary field that continues to develop in relation to digital technology, education, and scholarly communication. Publish or Perish and VOSviewer can be useful tools for mapping research trends and keyword networks in LIS. Future studies may use additional databases, broader search terms, and comparative bibliometric methods to obtain a more comprehensive picture of LIS research development.

5. AUTHORS' NOTE

The authors declare that there is no conflict of interest regarding the publication of this article. The authors confirmed that the paper was free of plagiarism.

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