



Design Thinking in Business: A Bibliometric Analysis of the Scopus Database 2002-2025

التفكير التصميمي في الأعمال: تحليل بيبليومتري لقاعدة بيانات سكوبس 2002-2025

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Abstract

Keywords

This study describes the evolution of publications in the field of design thinking through a bibliometric analysis of publications indexed in the Scopus database between 2002 and 2025, by using VOSviewer software. The study identifies key trends, prominent authors, universities, and influential journals in this field. The results indicate significant growth in publications, particularly between 2020 and 2025, with 245 articles and 7,554 citations recorded in 2025. The United States is the leading country in terms of publications, with 394 articles and 9,743 citations, followed by Australia. Delft University of Technology is the leading institution, while the University of Technology Sydney has produced highly cited research.

The journals *Design Studies*, *International Journal of Technology and Design Education*, and *Skills Thinking and Creativity* are among the most influential journals in terms of citations and network centrality. While design thinking, innovation, and design are among the most frequently used keywords, on the other hand, authors such as Magistretti and Wrigley receive the highest citation rates.

design thinking;
Bibliometric analysis;
Scopus database;
VOSviewer software;

JEL Classification Codes : O31 ; C38 ; D83 ; C88

المصطلحات المفتاحية	المخلص
التفكير التصميمي ؛ التحليل البيبليومتري ؛ قاعدة بيانات سكوبس ؛ برنامج VOSviewer .	تناولت هذه الدراسة وصف تطور للمنشورات الصادرة من قاعدة بيانات سكوبس في الفترة ما بين 2002 و 2025 وهذا استخدام برنامج VOSviewer . تحدد الدراسة الاتجاهات الرئيسية، والمؤلفين البارزين، والجامعات، والمجلات المؤثرة في هذا المجال. تشير النتائج إلى نمو ملحوظ في المنشورات، لا سيما بين عامي 2020 و 2025، حيث سجل عام 2025 نحو 245 مقالة و 7554 استشهادًا. وتعد الولايات المتحدة الأمريكية الدولة الأكثر إنتاجًا للمنشورات بـ 394 منشورًا و 9743 استشهادًا، تليها أستراليا. وتتصدر جامعة دلفت للتكنولوجيا قائمة المؤسسات الرائدة، بينما قدمت جامعة سيدني للتكنولوجيا أبحاثًا ذات استشهادات عالية. كما تُعد مجلات "دراسات التصميم"، و"المجلة الدولية لتعليم التكنولوجيا والتصميم"، و"مهارات التفكير والإبداع" من أكثر المجلات تأثيرًا من حيث الاستشهادات والمركزية الشبكية. في حين تُعد التفكير التصميمي والابتكار والتصميم من أكثر الكلمات المفتاحية استخدامًا، ويحظى مؤلفون مثل ماجيستريتي، وريغلي، بأعلى معدلات الاستشهاد.

تصنيف JEL : O31 ؛ C38 ؛ D83 ؛ C88

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I.INTRODUCTION:

Organizations today, in light of rapid developments across various fields, strive to adopt innovative, flexible, and human-centered approaches to value creation. In this context, design thinking has become a well-known paradigm that combines creativity, user empathy, and iterative experimentation to address complex and ill-defined problems (Brown, 2008; Buchanan, 1992). By aligning technological feasibility, economic viability, and the attractiveness of solutions, design thinking helps organizations transform deep customer insights into innovative solutions that enhance competitive advantage and value creation. Although design thinking is often presented as a modern managerial innovation, its philosophical roots trace back to design studies, where researchers have, over several decades, examined designers' creative ideas and problem-solving methods. (Johansson-Sköldberg et al., 2013; Plattner et al., 2012; Rowe, 1991).

While organized design thinking was formally acknowledged in the 1990s through its application in architecture and design practices, some research, like Ballhaus's 1954 study, helped emphasize it in technical domains. Design thinking has developed throughout time from a discipline-specific methodology to a multidisciplinary approach that is applied in a variety of fields (Fisher Jr et al., 2018; O'Callaghan & Connolly, 2020).

Design thinking is becoming more widely acknowledged as a strategic competency that fosters creativity and flexibility in the modern business environment. According to the resource-based view, valuable, uncommon, hard to replicate, and non-replaceable resources give businesses a long-term competitive edge (Barney, 1991). These qualities are embodied in design thinking, which incorporates traits that are hard to duplicate, such as originality and quick prototyping.

Additionally, according to Teece et al. (1997), design thinking may be viewed as a dynamic capability that improves an organization's capacity to recognize opportunities, take advantage of them, and reorganize its resources in response to environmental unpredictability. This viewpoint is especially crucial in unstable and uncertain situations where long-term success depends on ongoing learning and innovation.

In parallel, design thinking is emerging as a crucial tool in entrepreneurship and startups, which operate in highly dynamic environments and require close interaction with users and continuous iterative experimentation. Through a deep understanding of customer needs, rapid prototyping, and effective problem-solution alignment, design thinking enhances the effectiveness of entrepreneurial approaches and helps startups innovate and develop scalable projects.

Despite the growing presence of design thinking across various disciplines, studies have shown considerable variation in definitions, applied methodologies, and subject matter choices, resulting in the absence of a unified theoretical framework (Dorst, 2011). Furthermore, while subsequent research has highlighted key aspects of design thinking, there is no shortage of empirical evidence demonstrating its measurable outcomes, such as investment, project success, and other distinctive characteristics. This variation in the overall structure of the field limits the ability of technical experts and practitioners to develop distinctive strategic insights.

To address these limitations, bibliometric analysis (BA) provides a rigorous, transparent, and reproducible approach for systematically mapping the evolution of scientific knowledge. By analyzing large-scale publication data, BA enables the identification of research trends, influential contributors, collaboration networks, and thematic developments within a field (Maditati et al., 2018; Zupic & Čater, 2015). While previous bibliometric studies have examined specific aspects of DT—such as its relationship with entrepreneurial orientation or thematic diversity (Bhandari, 2023; Johann et al., 2020) comprehensive and longitudinal analyses that capture its multidisciplinary evolution and its intersection with business and entrepreneurship remain limited.

Accordingly, this study, titled “A Bibliometric View of Design Thinking: Scopus Database 2002–2025,” aims to provide a comprehensive and up-to-date analysis of Design Thinking research over a 23-year period. Drawing on Scopus-indexed publications, the study seeks to: (1) analyze publication trends and growth trajectories; (2) identify leading authors, institutions, countries, and journals; (3) map collaboration networks

To achieve these objectives, we will attempt to answer the following research questions:

- (RQ1): What are the main publishing trends and growth patterns in design thinking research between 2002 and 2025?
- (RQ2): Who are the most influential contributors (authors, institutions, countries, and journals) in the field of design thinking?
- (RQ3): What are the main collaborative networks and intellectual structures that shape design thinking research?

II. THEORETICAL FRAMEWORK AND PREVIOUS STUDIES:

The concept of design thinking did not emerge as a fully formed concept, but rather evolved gradually from earlier research that sought to understand complex problems by simplifying and breaking them down into manageable components (Beckman & Barry, 2007).

As the concept evolved, Johansson-Scholdberg et al. (2013) made an important distinction, separating "design thinking," which reflects the working methods of professional designers, from "design thinking" adapted for use in organizations by non-design professionals.

. This approach enabled design thinking to extend beyond design studios into other sectors such as business and management. Much of this expansion is attributed to the contribution of Tim Brown, who described it as a human-centered strategy that balances appeal, practicality, and feasibility (Brown, 2008). Around the same time, Martin (2010) described this technique as a blend of analytical thinking and intuition, something many companies are striving to achieve.

Despite the widespread use of design thinking today, a precise definition remains elusive. Different authors describe it in varying ways: some as a process, others as a thinking methodology, and still others as a set of tools (Brown, 2008; Elsbach & Stigliani, 2018). This diversity can be helpful, but it also creates some ambiguity. However, a review of the literature reveals several recurring principles, including user focus, idea development, and prototyping.

What makes design thinking interesting is its broad applicability; it's not limited to a single field. In business, for example, it's often used to support innovation and improve companies' understanding of their customers (Chang Wen, 2023; Fisher Jr. et al., 2018). Design thinking has also gained attention in the field of entrepreneurship. It is frequently used to rethink problems, explore new opportunities, and design solutions that better meet user needs (Carlgreen et al., 2016). In practice, it is often integrated with methodologies such as the agile startup methodology, where testing and iteration are key components (Montana and Boylat, 2023). This integration is particularly useful in uncertain situations, where decisions must be made quickly with minimal information.

Because design thinking research is spread across many disciplines, it can be difficult to see the full picture. This is where bibliometric analysis becomes important. Rather than focusing on a few studies, this approach relies on analyzing large collections of publications to identify patterns, trends, and relationships. For example, Johan et al. (2020) studied the relationship between design

thinking and entrepreneurial orientation, while Bhandari (2023) combined bibliometric analysis and systematic review to explore different research topics. These studies are useful, but they only cover a fraction of the field.

Bibliometric analysis also applies quantitative methods to evaluate scholarly output. Thanks to databases like Scopus and Web of Science, data mining has become easier. Software such as VOSviewer allows researchers to visualize relationships between authors, topics, and keywords (Koldopika et al., 2022). This facilitates understanding the structure of the field and how it has evolved over time (Ijaz et al., 2022).

Despite the growing interest in design thinking, some gaps remain. There is no single framework that encompasses everything, research is still fragmented, and current bibliometric studies are somewhat limited in scope. While studies such as those by Johan et al. (2020) and Bhandari (2023) offer useful insights, they do not fully cover the field's development. Therefore, this study takes a broader approach by analyzing Scopus data from 2000 to 2025. By combining performance analysis and science mapping, the study aims to provide a more comprehensive and long-term view of how design thinking research has evolved.

Headings are listed as follows (applied throughout the search):

III. METHOD AND PROCEDURES:

We used this bibliometric analysis to assess the development, structure, and trends of research in the field of design thinking during the period from 2002 to 2025. Bibliometric analysis is a well-established tool for evaluating research endeavors, recognizing key contributions, and uncovering scientific trends and theme shifts within a given subject (Wahid et al., 2020).

Given the scattered and diversified character of Design Thinking research documented in the literature, bibliometric methods are particularly appropriate for offering a comprehensive and data-driven picture of the field's intellectual structure.

The bibliographic data were gathered from the Scopus database, which was selected due to its vast coverage of high-quality peer-reviewed literature, specifically in the disciplines of management and business, as well as its applicability for sophisticated bibliometric analysis (Mongeon & Paul-Hus, 2016). Scopus is generally rated a top database for multidisciplinary study, making it an excellent choice for researching Design Thinking literature, which encompasses several fields.

To ensure transparency, the database was searched as follows: TITLE-ABS-KEY ("Design Thinking") AND PUBYEAR > 2001 AND PUBYEAR < 2026. We did the search in March 2026, and the results were limited to articles within the stated time window.

The screening process was conducted according to PRISMA recommendations (Aris et al., 2022). The analysis was limited to articles published in peer-reviewed English-language journals, excluding conference proceedings and book chapters. The title, abstract, and keywords are important elements, as they accurately reflect the main concepts and objectives of the publications. This, in turn, improves the accuracy of the bibliometric analysis (Zakaria et al., 2021).

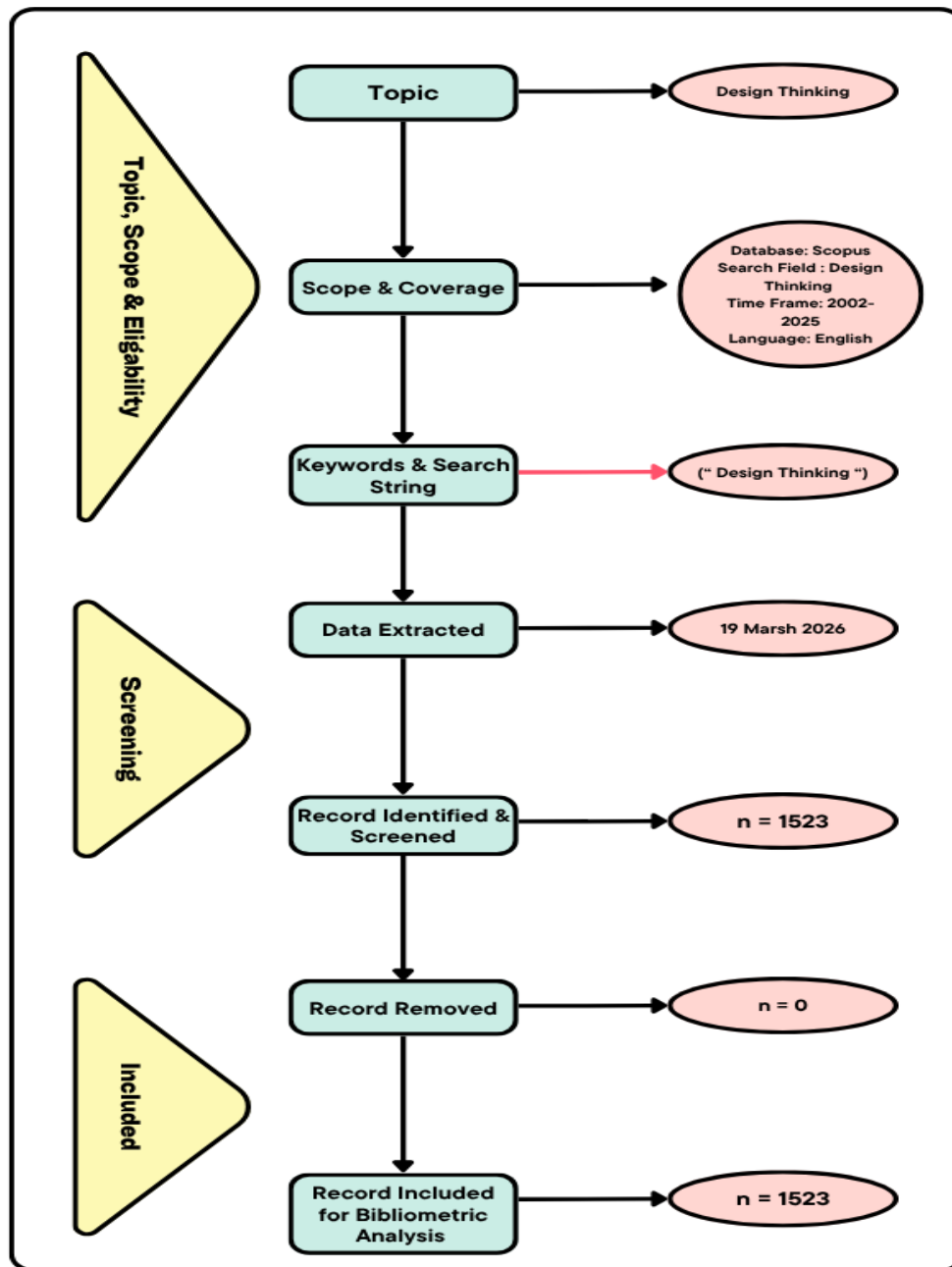
A CSV file containing complete bibliographic information, such as authors, titles, abstracts, keywords, institutional affiliations, and citation count, was uploaded. The dataset also underwent a cleaning process to remove duplicate data, clarify author names, and standardize keywords to address discrepancies. Figure 1 summarizes this process, illustrating the steps used in the analysis.

The study integrates descriptive bibliometric approaches with performance analysis to provide a thorough review of the field. Annual publication patterns were assessed, including the identification of the most productive authors, institutions, nations, and journals. Standardized metrics were also applied to total citations, average citations per document, and h-index (Wahid et al., 2020).

To better explore the intellectual, social, and conceptual framework of Design Thinking study, scientific mapping tools were utilized. Co-authorship analysis was used to assess collaboration patterns among researchers and countries, co-citation analysis to uncover the underlying knowledge base for the conceptual design, and keyword frequency analysis to identify key research themes.

A range of specialized procedures were also implemented to ensure the quality of the analyses. VOSviewer (version 1.6.15) was used to create and display bibliometric networks, particularly maps of the links between authors, keywords, and publications. Additionally, Microsoft Excel 2016 was used for descriptive statistics.

Figure (01): Analytical flowchart for reviewing Design Thinking articles.



Source: Prepared by the researcher

IV.RESULTS AND DISCUSSIONS :

1. Publishing Growth and Trends :

A search of the Scopus database revealed 1,539 published articles between 2002 and 2025. Publication patterns were analyzed by examining the documents by year of publication. Publication trends and citations are key indicators for tracking the development of any research field (Luo et al., 2024). The results indicate a significant increase in the number of publications during the study period.

Figure 2 presents the evolution of publication activity in design thinking research over the period from 2002 to 2025, based on data retrieved from the Scopus database.

In the early years (2002–2006), the field attracted very little attention, with only a handful of publications (6 in total) and just 3 recorded citations. A noticeable shift began between 2007 and 2014, when research output started to increase, reaching 81 publications and 392 citations. This suggests that academic interest in design thinking was gradually building during this period.

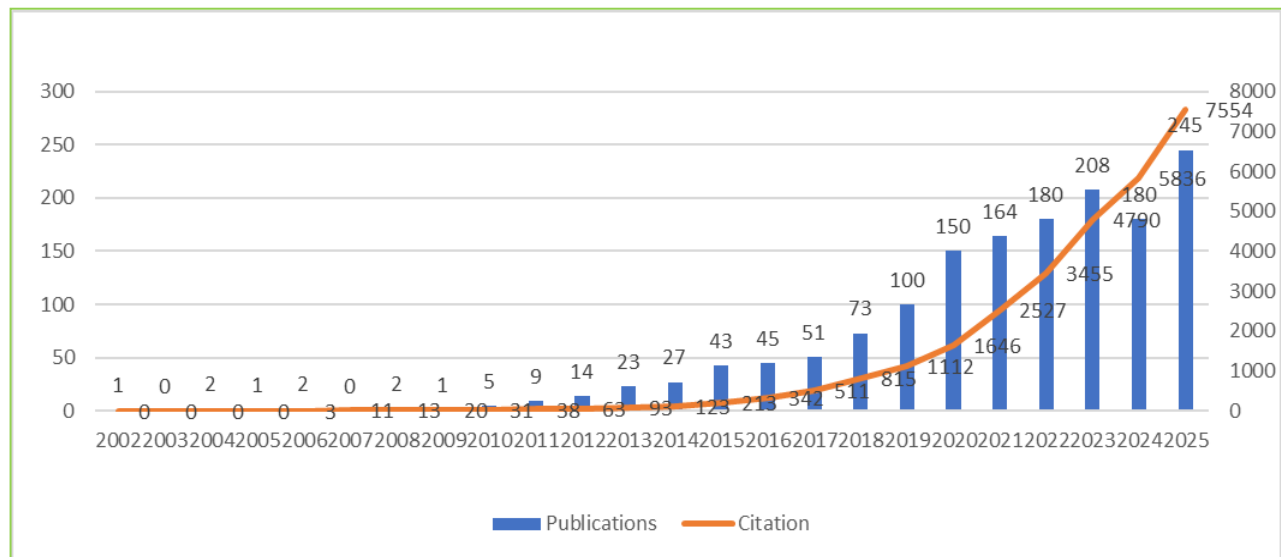
Growth became much more pronounced from 2015 to 2021. Over this period, the number of published studies increased considerably, reaching 626 articles. At the same time, citations rose sharply to 7,166, suggesting that the field was not only growing in size but also gaining greater academic attention. This stage can reasonably be viewed as a key moment in the development of the field.

The same pattern continued in the following years (2022–2025). During this time, publication output reached 813 articles, while citation counts increased even more rapidly, totaling 21,635. This notable rise reflects both stronger research activity and a wider acknowledgment of design thinking within the academic community.

A closer look at yearly data shows that 2025 recorded the highest number of publications, with 245 articles. It was followed by 2023, which accounted for 208 publications. In comparison, 2022 and 2024 reported similar figures, each with 180 articles. Citations followed a comparable trend, with the highest value observed in 2025, reaching 7,554.

Overall, these results indicate a consistent increase in both the volume of research and its impact. This pattern reinforces the idea that design thinking has become an increasingly important topic in recent academic work.

Figure (02): Articles on human resource training per year.



Source: Prepared by researcher using the Scopus database

2 .Productivity Analysis:

This section looks at the productivity of design thinking by authors, organizations, and journals using measures such as the number of research publications, citations, and network maps.

a- Author Productivity Analysis :

Between 2002 and 2025, **1,523** articles in design thinking research were found, with authors from 109 different countries. The average number of authors per document was **2.62**, reflecting a strong trend toward collaborative research in this multidisciplinary field.

The most productive authors are listed in **Table 1**. **Magistretti** ranks first with **15** publications and **570** citations, demonstrating both high productivity and significant scholarly influence. **Wrigley and Mentzer**. follow with **12** publications each; however, **Wrigley's** higher citation count (**434**) compared to **Mentzer** (**165**) highlights that research impact depends not only on quantity but also on the relevance of contributions. Other authors, such as **Dell'Era**. and Chai, also show high citation performance relative to their publication output see **Table 1**, indicating the production of influential works.

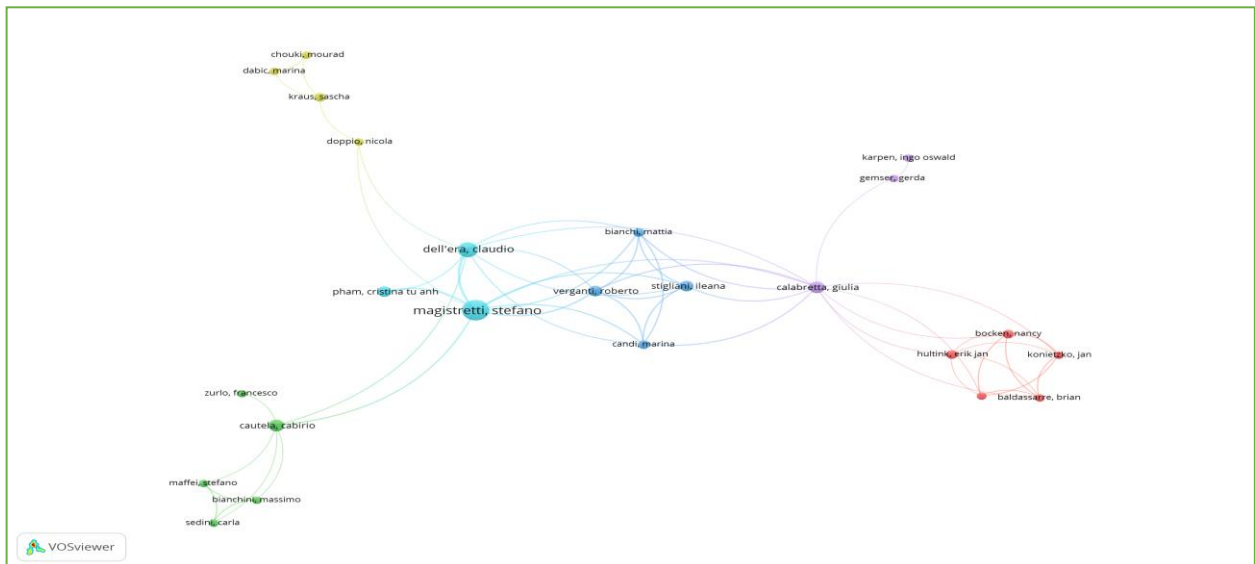
Table (01): Most Productive Authors Based on Publications, Citations, and Total Link Strength (2002–2025).

Author	Affiliation	Country	Publications	Link Strength	Citations
Magistretti, S.	Scuola di Management	Italy	15	38	570
Wrigley, C.	The University of Queensland	Australia	12	14	434
Mentzer, N.	Purdue University	United States	12	23	165
Dell'Era, C.	Politecnico di Milano	Italy	8	23	313
Chai, C. S.	Chinese University of Hong Kong	Hong Kong	7	8	462
Moseley, G.	The University of Queensland	Australia	7	8	237
Vignoli, M.	Alma Mater Studiorum Università di Bologna	Italy	7	8	117
Dosi, C.	Alma Mater Studiorum Università di Bologna	Italy	6	8	109
Dong, A.	The University of Sydney	Australia	6	7	268
Calabretta, G.	Delft University of Technology	Netherlands	5	24	206

Source: Prepared by the researcher using the Scopus database

The co-authorship network, illustrated in **Figure 3**, reveals patterns of collaboration among authors. Although **295** authors met the inclusion criteria, only **24** appear in the network due to interconnected networks, suggesting that many researchers work in relatively isolated groups. The network is organized into five subgroups of closely collaborating researchers. The central group, dominated by **Magistretti, Del Era**, brings together multiple subgroups and facilitates knowledge sharing, while the subgroups exhibit strong internal collaboration but limited external connections. Total link strength (TLS), shown in both **Table 1** and **Figure 3**, confirms the central role of key authors, particularly **Magistretti**. Overall, the network indicates a partially integrated research structure, with opportunities for broader collaboration in the future

Figure (03): Author Collaboration Network Based on Co-authorship



Source: Prepared by the researcher using VOSviewer software

b- Institutional Productivity Analysis :

Table 2 shows the most influential universities in this research field. **Delft University of Technology** ranks **first** with **32** publications, **1383** citations, and an h-index of **16**. **Purdue University** comes in second with **27** publications, **598** citations, and an h-index of **13**, followed by **Politecnico di Milano** with **24** publications, **650** citations, and an h-index of **13**. We also note that the next four positions are occupied by **Australian universities**, followed by two **US universities** in eighth and ninth place, and the **National Taiwan Normal University** in tenth.

Table 2 demonstrates a direct correlation between the number of publications and the number of citations. However, it also suggests that high-quality research can have a greater scientific impact, even if there are fewer publications.

Table (02): Leading Universities by Publications, Citations, and h-index in Design Thinking Research (2002–2025)

Rank	University	pay	Total of documents	Total of citation	h-index
1	Delft University of	Netherlands	32	1383	16

Technology					
2	Purdue University	United States	27	598	13
3	Politecnico di Milano	Italy	24	659	13
4	The University of Sydney	Austria	22	983	15
5	The University of Queensland	Australia	21	602	12
6	University of Melbourne	Australia	18	911	12
7	Queensland University of Technology	Australia	12	363	8
8	Stanford University	United States	13	468	11
9	Brigham Young University	United States	8	69	4
10	National Taiwan Normal University	Taiwan	12	247	8

Source: Prepared by the researcher using the Scopus database

c- Journal Productivity Analysis :

Leading journals are summarized in **Table 3**, which reports total documents, citations, h-index, and total link strength. Design Studies and Thinking Skills and Creativity demonstrate the highest citation impact, confirming their role as core outlets in the field.

Table (03): The Most Influential Journals in Design Thinking Research

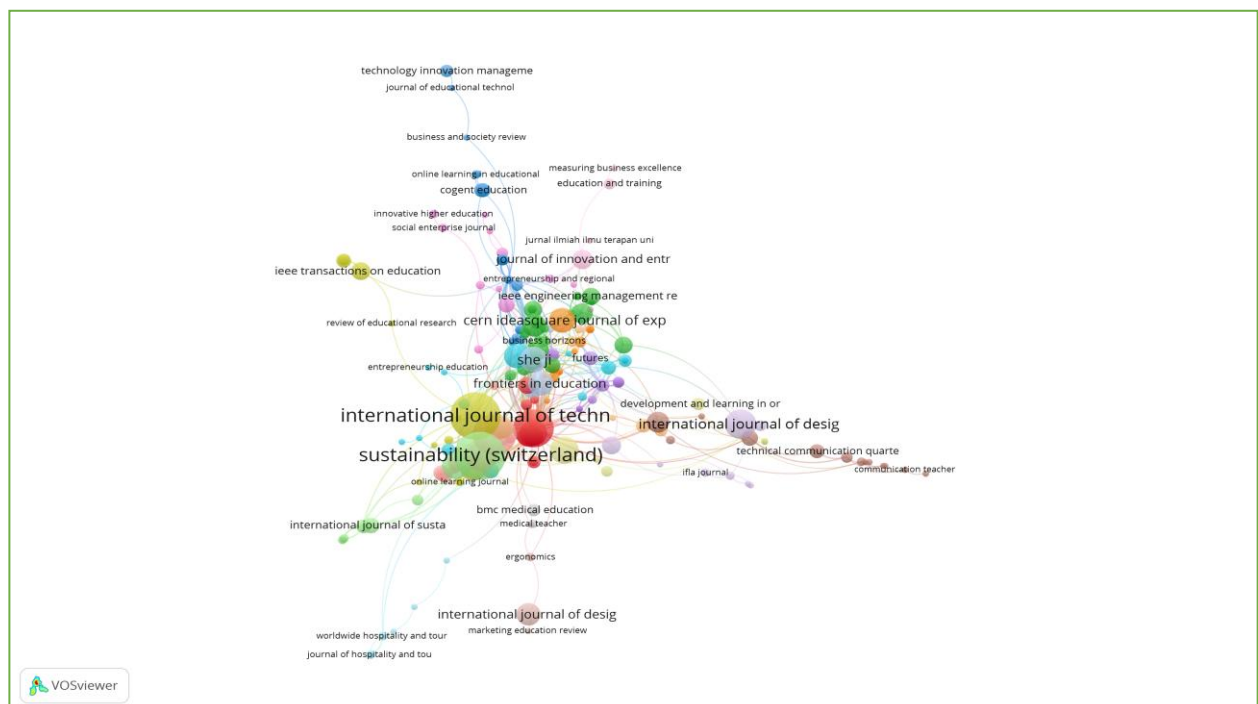
Rank	JOURNAL	Publisher	Total link Strength	Total of documents	Total of citations	h-index
1	Sustainability Switzerland	MDPI	25	57	699	16
2	International Journal of Technology and Design Education	Springer Nature	35	49	1140	19
3	Thinking Skills and Creativity	Elsevier	22	37	1453	20
4	Design Studies	Elsevier	216	30	2809	20
5	International Journal of Design Education	Common Ground Research Networks	4	15	35	3
6	Journal of Engineering Education Transformations	Rajarambapu Institute	2	13	68	4

Of Technolo gy						
7	Education Sciences	MDPI	4	15	235	8
8	Journal of Cleaner Production	Elsevier	9	17	1329	15
9	International Journal of Engineering Education	Tempus Publicatio ns	2	13	194	7
10	She Ji	KeAi Communi cations Co	27	16	929	12

Source: Prepared by the researcher using the Scopus database

The relationships and connections between the journals are illustrated in **Figure 4**. Journals such as **the International Journal of Technology, Design and Sustainability Education (Switzerland)** occupy a central position, acting as a link between different research fields. The grouping in **Figure 4** highlights the multidisciplinary nature of design thinking research, which encompasses fields such as design and engineering education, sustainability, innovation and entrepreneurship, and creativity studies. **Design studies** play an intermediary role, connecting multiple groups and facilitating the integration of knowledge in this field.

Figure (04): Network Visualization of Journal Relationships Based on Co-citation Analysis



Source: Prepared by the researcher using VOSviewer software

3. Country Productivity Analysis:

Table 4 presents an analysis of co-authorship among the most influential and productive countries in the field of design thinking, as well as the degree of collaboration among these countries. **Figure 5** illustrates the network of co-authorship among countries in scientific articles related to design thinking from 2002 to 2025. **109 countries** contributed to this research, reflecting the broad academic interest in design thinking across different geographic regions. A minimum threshold of **five citations** was used, and **88 countries** were found to be linked to each other and divided into **20 groups**, as shown in **Figure 5**. These groups represent different collaborative communities

From the results of the table, we see that the **United States** ranks **first** with **394** publications, representing about **21%** of the total number of publications, along with **9743** citations and a total linking power of **306**. This confirms its pivotal role not only in terms of the number of research papers, but also as a major center for international cooperation. In the network representation, the **United States** occupies a prominent central position thanks to its extensive and interconnected links with countries in Europe, Asia, and Oceania, highlighting its role as a global hub for design thinking research.

As the table shows, **Australia** ranks **second** in the number of research publications, with **136** (approximately **7.25%**), and boasts the highest overall strength of its links **353** among all countries. These results explain its pivotal role in fostering research collaboration. This is further confirmed by the network map, which shows Australia in a central position with numerous strong links extending to all countries.

The **United Kingdom** also ranked **third** with **101** publications approximately **5.39%** of the total research and **3156** citations, in addition to **123** links. This confirms the strength of its network. The network map shows that it serves as a bridge for knowledge exchange between European and Asian countries.

Germany, with **69** publications and **93** links, played a pivotal role within the European group. **Italy**, with **64** publications and **72** links, is positioned closer to the United States within the network, demonstrating strong collaboration between the two. We also noted that the **Netherlands**, despite having a relatively small number of publications **61** publications, has **321** links.

China also ranks **63** publications, with **79** links. India has **68** publications, representing approximately **3.63%**, with **69** links. As the map shows, both countries are integrated into the global collaborative network, located near the network's center. However, their links are less compared to leading countries, indicating that their international collaborative networks are still developing..

From a regional perspective, Africa and the Arab world remain underrepresented in the global co-authoring network. **Nigeria** ranks **42nd**, with **ten** publications (approximately **0.53%** of total output), **67** citations, and four citations. As the map shows, Nigeria appears as a marginal cluster with limited connections, indicating its weak integration into the global research community. **Saudi Arabia** ranks **41st**, with **10** publications, **98** citations, and **4** links. Saudi Arabia remains on the periphery of the network, reflecting an emerging but still limited role in research collaboration.

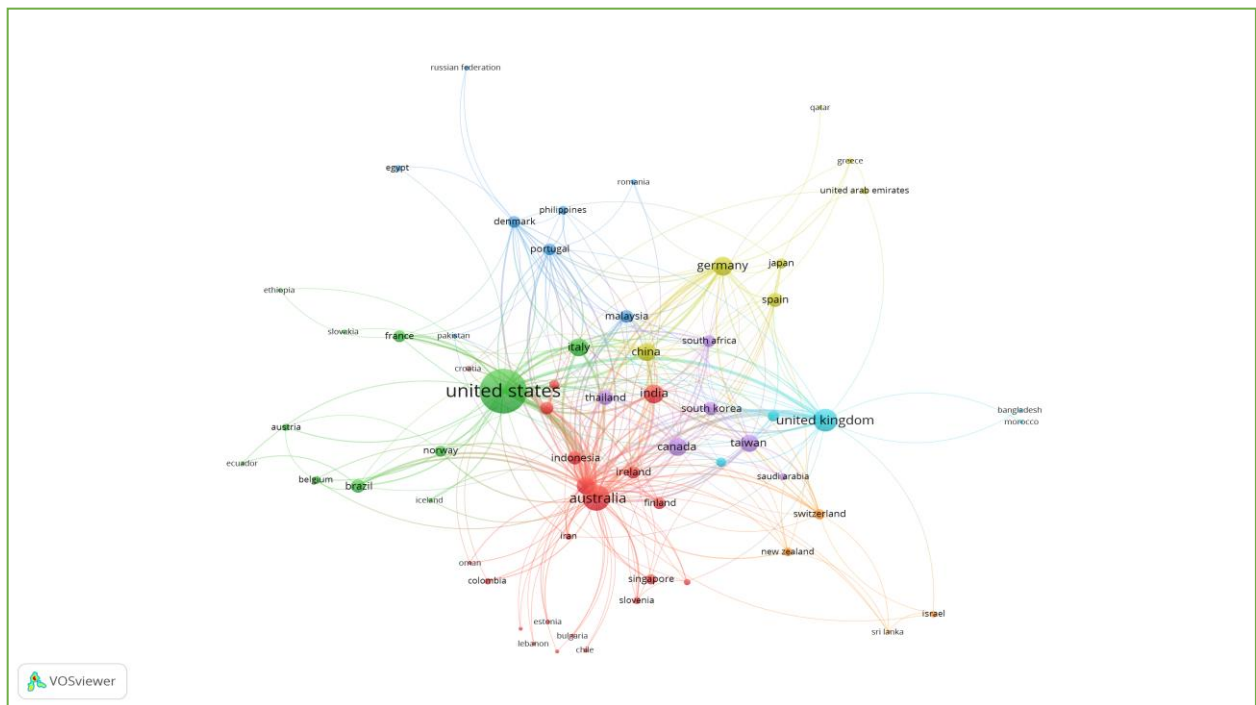
The above indicates the dominance of the United States, Australia, and the United Kingdom in terms of the number of articles, citation impact, and collaborative strength. Countries Like as Germany, the Netherlands, Italy, and China also play key mediating roles, while countries like Nigeria and Saudi Arabia demonstrate limited participation and influence.

Table (04): Leading Countries in Design Thinking Research Publications

Rank	Country	Total Publications	Total Link Strength	Total Citations	Links	Cluster
1	United States	394	306	9743	43	2
2	Australia	136	353	5728	49	1
3	United Kingdom	101	123	3156	31	6
4	Germany	69	93	1309	26	4
5	India	68	69	638	18	1
6	Canda	67	51	1471	16	5
7	Italy	64	72	1550	12	2
8	China	63	79	1020	22	4
9	Netherlands	61	321	3450	49	1
10	Taiwan	59	38	912	16	5
41	Saudi arabia	10	4	98	4	5
42	Nigeria	10	4	67	4	4

Source: Prepared by the researcher using VOSviewer software

Figure (05): Network visualization map of countries publishing on design thinking from 2002 to 2025.



Source: Prepared by the researcher using VOSviewer software

4 .Citation Analysis:

The key authors and publications that impacted the review's progress were determined through citation analysis. The number of citations and citations per year can also be used to evaluate a researcher's productivity. This bibliometric metric is often used to quantify the significant influence of the focused research field (Ahmi et al., 2020; Pirri et al., 2020).

Table 5 summarises the citation metrics for the retrieved documents. **Table 5** shows the overall number of citations for all retrieved publications and the average number of citations per year. There shown, there were **32309** citations recorded for **1523** retrieved publications over **24** year period (**2002-2025**), with an average of **1346.2** citations per year and **21,21**citations/papers. The h index for records retrieved was **52**.

Table (05): Citations Metrics.

Metrics	Data
PAPERS	1523
Number of Citations	32,309
Years	24
Citations Per Year	1346.2
Citations Per Paper	21,21
Number of Author	3993
Cites Author	8.09
h_index	52

Source: Prepared by the researcher using the Scopus database

Table 6 shows the top 10 highly cited topics of design thinking. " The core of 'design thinking' and its application," the article with the most citations, was published in the Journal of DesignStudies.

The top ten highly cited articles in design thinking research demonstrate the field's scholarly influence and thematic breadth across multiple disciplines. Dorset's seminal 2011 article, "The Essence of Design Thinking and Its Applications," published in the Journal of Design Studies, is a cornerstone of the field, receiving 1409 citations, making it a fundamental reference for subsequent research. Razouk and Schott's 2012 study, "What Is Design Thinking and Why Is It Important?" published in the Journal of Educational Research Review, received 1006 citations .

The article by Geisdorfer, Boken, and Holting, published in Cleaner Production in 2016, entitled "Design Thinking to Enhance Sustainable Business Models: A Value Mapping-Based Workshop," received 389 citations, while the article by Elsbach and Stigliani, published in Management in 2018, entitled "Design Thinking and Organizational Culture: A Review and Framework for Future Research," received 384 citations, focusing on the organizational and cultural dimensions of design thinking.

Meyer and Norman's study, "Changing Design Education for the 21st Century," published in the

journal She Ji, also received 310 citations. Oxman's 2006 foundational article, "Theory and design in the first digital age", also in Design Studies, has 307 citations, reflecting its enduring influence in digital design theory.

Henriksen, Richardson, and Mehta's 2017 article, "Design thinking: A creative approach to educational problems of practice", in Thinking Skills and Creativity, has 292 citations. McGann, Blomkamp, and Lewis's 2018 study, "The rise of public sector innovation labs: experiments in design thinking for policy", published in Policy Sciences, has 258 citations, demonstrating the application of design thinking in public sector innovation.

Kimball's study, "Rethinking Design Thinking: Part Two," published in the Journal of Design and Culture in 2012, received 247 citations, while in 2012, Pandey and Bharati's article, "Theoretical Foundations of Design Thinking - A Constructivist Learning Approach to Design Thinking," published in the Journal of Thinking and Creativity Skills, received 231 citations, highlighting the ongoing theoretical and educational development.

As we observed in the network map illustrates several sub-clusters: the red cluster related to management and business, the green cluster related to design, and the blue cluster related to education, further highlighting the interdisciplinary nature of this field of study.

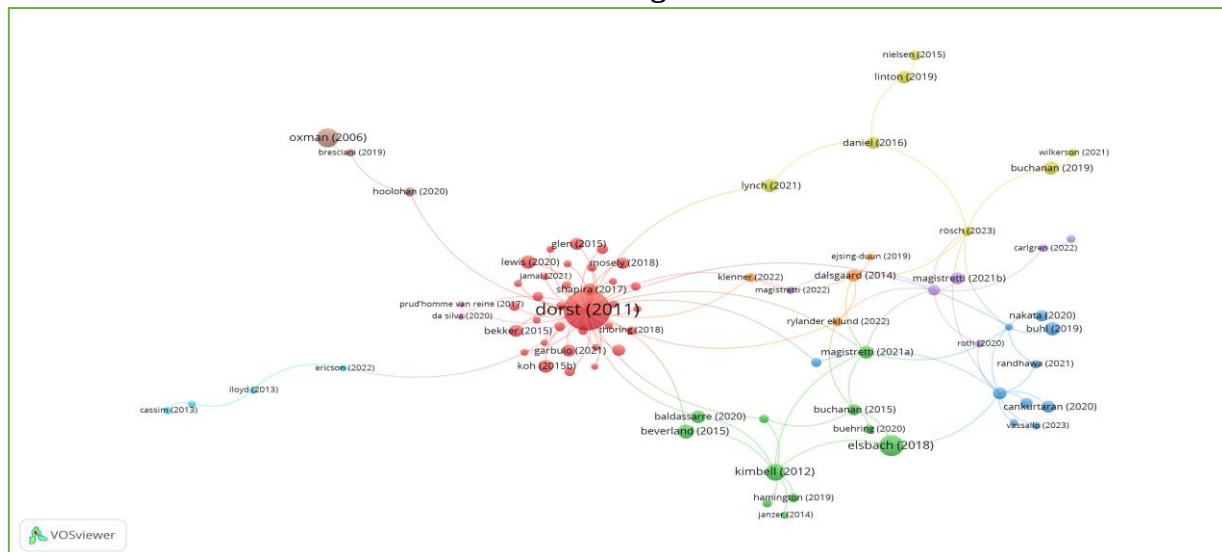
Table (06): Top 10 highly cited articles in design thinking research.

Rank	Authors	JOURNAL	Title	Year	Total Cites	Cites per Year
1	Dorst, K.	Design Studies	The core of 'design thinking' and its application	2011	1409	93.93
2	Razzouk, R.; Shute, V.	Review of Educational Research	What Is Design Thinking and Why Is It Important?	2012	1006	71.86
3	Geissdoerfer, M.; Bocken, N.M.P.; Hultink, E.J.	Journal of Cleaner Production	Design thinking to enhance the sustainable business modelling process – A workshop based on a value mapping process	2016	389	38.90
4	Elsbach, K.D.; Stigliani, I.	Journal of Management	Design Thinking and Organizational Culture: A Review and Framework for Future Research	2018	384	48.00
5	Meyer, M.W.; Norman, D.	She Ji	Changing Design Education for the 21st Century	2020	310	51.67
6	Oxman, R.	Design Studies	Theory and design in the first digital age	2006	307	15.35
7	Henriksen, D.; Richardson, C.	Thinking Skills and	Design thinking: A creative approach to	2017	292	32.44

	Mehta, R.	Creativity	educational problems of practice			
8	McGann, M.; Blomkamp, E.; Lewis, J.M.	Policy Sciences	The rise of public sector innovation labs: experiments in design thinking for policy	2018	258	32.25
9	Kimbell, L.	Design and Culture	Rethinking design thinking: Part II	2012	247	17.64
10	Pande, M.; Bharathi, S.V.	Thinking Skills and Creativity	Theoretical foundations of design thinking – A constructivism learning approach to design thinking	2020	231	38.50

Source: Prepared by the researcher using the Scopus database

Figure (06): Network visualization of a collaborative work by researchers in Design Thinking



Source: Prepared by the researcher using VOSviewer software

5. Keyword Co-occurrence Analysis:

Author keywords play a pivotal role in identifying relationships between design thinking research and related fields. Furthermore, keyword frequency helps reveal key research trends and prevalent themes in the literature. To explore this, we used a frequency test as a type of analysis using **VOSviewer software**. We selected author keywords that appeared at least ten times in the program. A total of **259 keywords** were identified from the data, as shown in **Figure 7**.

As illustrated in Figure and **Table 7**, the most frequently used keywords in design thinking studies are: “**design thinking**” (1523 times), “**creativity**” (364 times), “**design**” (162 times), and “**students**” (106 times), followed by “**innovation**” (once). **Table 7** shows the remaining keywords and their frequency across various research papers.

The network map shows ten research clusters. The red cluster indicates key ideas in the field, including common terms like design thinking, innovation, design, creativity, and sustainability. The

V.CONCLUSION:

The concept of design thinking has garnered significant attention from researchers and practitioners. Bibliometric analysis is a practical method for examining patterns and trends in published research (Bessin et al., 2023; Van Eck and Waltman, 2010). This study analyzed design thinking research published between 2002 and 2025 using the Scopus database, providing insights into publishing trends, prominent authors, universities, and journals. The field experienced significant growth between 2020 and 2025, with 2025 recording the highest number of publications (245) and 7,554 citations.

The United States exhibited the highest number of research publications, producing 394 and garnering 9,743 citations, followed by Australia with 136 publications and 5,728 citations. On the other hand, Delft University of Technology occupies a prominent position among institutions, having published 32 publications and received 1383 citations, while the University of Sydney of Technology achieved 1409 citations for a single article.

Design Studies is a prominent journal, publishing 30 articles, accumulating 2,809 citations, and exhibiting the greatest total link strength at 216. The International Journal of Technology and Design Education and Thinking Skills and Creativity are ranked second and third, respectively, indicating their substantial impact and centrality within the research network. Furthermore, journals such as Sustainability (Switzerland), She Ji, and the Journal of Cleaner Production make significant contributions, thereby underscoring the field's interdisciplinary character.

Design Thinking, Innovation, and Design are the most frequently used keywords. Each author contributed to one or two publications, with Magistretti receiving the highest number of citations 570, followed by Wrigley 434 citations. Although bibliometric analysis provides a useful quantitative overview of trends and patterns, it fails to capture the qualitative dimensions inherent in Design Thinking methodologies. Consequently, practitioners should augment these quantitative findings with case studies, experiential knowledge, and practical applications within business incubators and entrepreneurial endeavors to formulate more actionable and efficacious strategies. The observed expansion in both publications and citations highlights the growing importance of Design Thinking in facilitating organizational goals, stimulating innovation, and empowering startups and entrepreneurial projects to secure a competitive edge. Identifying key journals, prevailing trends, and influential networks can assist practitioners in navigating the most pertinent and impactful knowledge within this domain.

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