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Evaluation of Interior Architecture Education Research in the Web of Science Database: Bibliometric and Science Mapping Analysis

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Abstract

The aim of study is a bibliometric analysis of the publications in the Web of Science database related to interior design education. The research was carried out between 10 January and 12 February 2023. Searches in the TIT-ABS-KEY field of WOS search engine. "Interior architecture education" (Topic) OR "interior architecture education" (Topic) OR "interior design education" (Topic) OR "interior design education*" (Topic) generating 125 publications on the subject. Most of these were "Proceeding Paper" with 66 publications and in the top position of "Educational Research" with 65 publications; the "Architecture" category came in second with 26 publications. In addition, "Procedia Social and Behavioral Sciences" resulted in 25 publications and the "Journal of Interior Design" in 12 publications. Among the WOS indexes, "CPCI-SSH" contains 62 publications. The words most frequently used by authors are interior architecture education, interior architecture, design studio, education, sustainability, design, creativity, design thinking, design processes, and computer-aided design.*

Keywords: *Interior design education, interior architecture education, bibliometric analysis, science mapping, web of science.*

Web of Science Veri Tabanındaki İç Mimarlık Eğitimi Araştırmalarının Değerlendirilmesi: Bibliyometrik ve Bilim Haritalama Analizi

Öz

Bu makalenin amacı iç mimarlık eğitimiyle ilgili Web of Science veri tabanındaki yayınların bibliyometrik analizini yapmaktır. Araştırma 10 Ocak-12 Şubat 2023 tarihleri arasında gerçekleştirilmiştir. Web of Science veri tabanında başlık-özet-anahtar kelimelerinde "iç mimarlık eğitimi" veya "iç mimarlık eğitimi" veya "iç mekân tasarım eğitimi" veya "iç mekân tasarım eğitimi*" kelimeleriyle araştırılmıştır. Buna göre konuyla ilgili 125 yayına erişilmiştir. Bu sonuçlara göre doküman türü olarak 66 yayın sayısıyla en fazla konferans bildirisi bulunmaktadır. "Eğitim Araştırmaları" kategorisinde 65 yayın bulunmaktadır. "Mimarlık" kategorisi 26 yayınla ikinci sırada gelmektedir. Ayrıca "Procedia Social and Behavioral Sciences" 25 yayın ve "Journal of Interior Design" dergisi12 yayına sahiptir. WoS indekslerinden "Conference Proceedings Citation Index - Social Science & Humanities (CPCI-SSH)" 62 yayını bulunmaktadır. Yazarların yayınlarında en çok kullandıkları kelimeler ise iç mimarlık eğitimi, iç mimarlık, tasarım stüdyosu, eğitim, sürdürülebilirlik, tasarım, yaratıcılık, tasarım düşüncesi, tasarım odaklı düşünme, tasarım süreçleri ve bilgisayar destekli tasarımdır.*

Anahtar kelimeler: *İç mimarlık eğitimi, bibliyometrik analiz, bilim haritalama, web of science.*

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1. Introduction

Interior architecture: It is known as an organization of spaces such as living, working, and entertaining which includes art, science, and technology. It aims to transform the form, texture, color, and lighting in these spaces into a more qualified one for human life. Well-designed spaces not only provide shelter but also make people feel good, and have a positive effect on many aspects such as socialization and learning (IIDA, 2023). In interior architecture education, the goal is for students to gain the ability to produce creative designs that respond to social, cultural, and technological developments. Design education comprises the act of design and is shaped by applied methods. The process, not the result, is important in design education (Özkan et al., 2016). The process in question begins the moment one encounters the design problem. In other words, the real situational problem revolves around the learning experience in the design studio, which is the focus of all design-related programs (Schön, 1985). Interior architecture education questions the relationship between the building and the person and analyzes the building through its user; it is a discipline that forms the relationship between the structure and user through function, user, and aesthetics. Humans and space are the main fields of study in interior architecture, and it deals with space for people, contributing to the lives of individuals within that space.

According to Demirbas (2017), *"An interior architect, who researches and solves problems related to the level and functionality of interiors by adding creativity; designing space, making design analysis, providing information on-site inspection, building systems, aesthetics, interior construction information, fittings, materials, equipment; It is the person who has training and experience to prepare drawings and documents related to the interior."* (IFI-International Federation of Interior Architects/Designers, 2023).

When the publications on interior architecture education are examined, as a result of the literature review, research related to interior design education in the ProQuest Dissertations & Theses Global database is available (Sagun, 1999; Botti-Salitsky, 2005; Al-Salem, 2014; Liu, 2020). Furthermore, there are studies conducted with students in interior architecture studios (Demirbas & Demirkan, 2000; Tanrıover et al., 2015; Rauf et al., 2020; Kaya & Bilgiç, 2020). The Council of Higher Education Thesis Center Ph.D. theses on interior architecture education were also accessed. Other studies focused on the following: the relationship between learning styles and performance scores of students (Demirbaş, 2001); the effect of the parametric design approach (Şekerci, 2020); creative thinking in the process of basic design (Aşkın, 2020); and the use of virtual reality technology (Kılıç, 2020) (YÖKTEZ, 2023). Research on current and potential future trends and how they might affect the interior architecture profession and interior design education (Fowles, 1991), cirruculum development (Cordan et al., 2014), concept and scale (Hasırcı et al., 2022), virtual reality (Meggs et al., 2012) and augmented reality (Gürçınar & Esen, 2018).

In addition, The Chamber of Interior Architects, with the regulation published in the Official Gazette No. 26999 on September 16, 2008, legally determines the working areas and methods of interior architects working within the borders of Türkiye. "Regulation on Implementation, Registration and Professional Inspection of Freelance Interior Architecture Services" defines the design and service areas of Interior Architects under the title, "Design, implementation, consultancy and other services."

These areas can be briefly listed as follows:

1) Interior design, original movable-fixed furniture, and accessory design of these spaces,
2) Project design and implementation of interior equipment, equipment, and productions,
3) Development, renewal, and/or development with new design ideas according to the conditions of the old function. Production and arrangement of function modification projects to be envisaged in the interior spaces of the buildings that will gain a new function different from the old one,
4) Surveying and dimensioning for the interior,
5) Interior architecture project services,

6) Specifications for the interior, preparation of the tender dossier, and professional inspection and supervision services,
7) Interior decoration,
8) Producing proposals for multi-disciplinary fields in environmental design, interior projects, and application services,
9) Application of color, texture, and material selection in accordance with the designed interior,
10) Fair stands and exhibition organization and organization of exhibition areas, design applications with similar processes, and design and implementation of necessary accessories and environment requirements with installations,
11) Interior arrangements of land, sea, and aircraft vehicles,
12) Set and stage decoration,
13) Interior production and implementation of interior projects, together with relevant training for those involved in projects for space restoration, restitution, and conservation,
14) Continuous technical control and building sustainability projects,
15) Consultancy and consultancy services (Kaptan, 2016).

The focus of this article is on publications related to interior architecture and design education. First, interior architecture education was searched in Google Ngram to explore the literature. Related to this process, the e-book graphic about "Interior Design Education", published between 1900 and 2019, is shown in Figure 1. The greatest numbers of publications were produced in 1991.

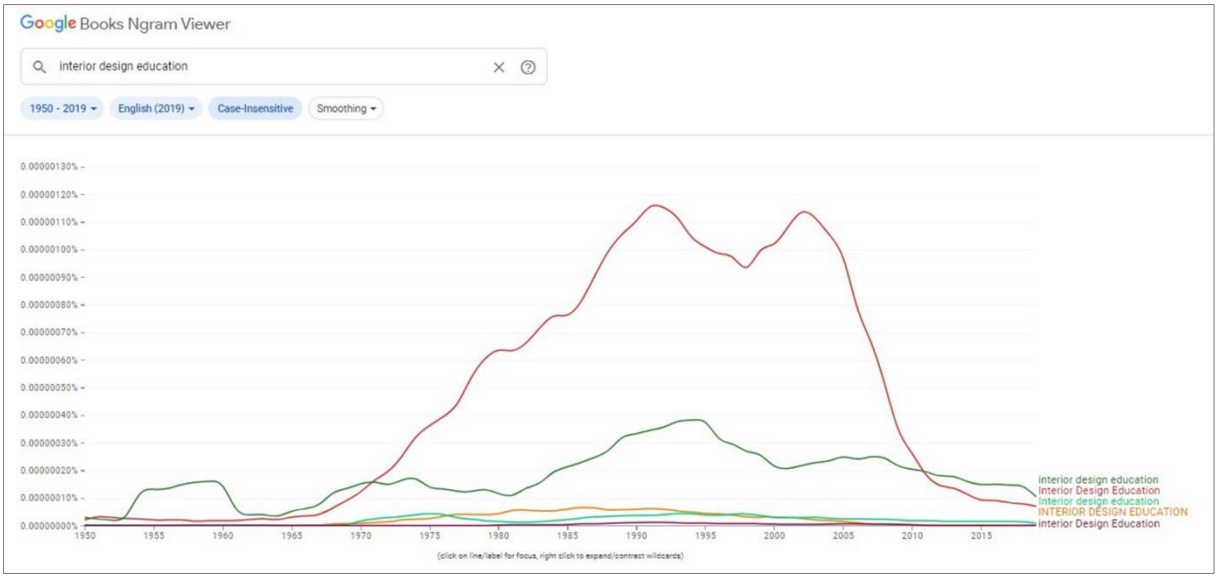

Figure 1. Google books ngram viewer (Google Books, 2023)

Mitton's *"Interior design visual presentation: A guide to graphics, models and presentation techniques"* describes quick sketches that help produce an entirely constructed model and as well as the capability to produce visual representations of designs, which is essential for any designer (Mitton, 2012). The book comprehensively describes interior design communications used throughout the design process and is complemented by many real-world examples.

Blossom & Thompson (2015) *"The Handbook of Interior Design"* examines the mental models that underlie the field of interior design. It asks readers to reflect on the relationships between theory, research, and practice, as well as the important principles that influence interior design.

Sully (2015) *"Interior Design: Conceptual Basis"* explains the conceptual process of interior design and the concepts making up the discipline. It also provides instructions to help the designer streamline the design process and sharpen the connections between the various skills bases required to do the job.

In addition, it allows designers to focus on each concept as independently as possible while accepting relative connections without undue influences that lead to conceptual bias.

The questions that this research focuses on are:

- Which publications are related to interior architecture/design education?
- Which publication is most cited in the Web of Science (WOS) database on interior architecture/design education?
- Which index contains the most publications in the WOS database on interior architecture/design education?
- In which categories are interior architecture/design education publications found in the WOS database?
- Which keywords did the authors use most in their publications on interior architecture/design education?

2. Research Methodology

This study makes use of the quantitative research method. The bibliometric analysis method was also used in the research. A quantitative analytic technique called bibliometrics uses mathematical and statistical techniques to quantify the interactions and impacts of publications in a certain field of study. This approach can offer a macroscopically summary of a sizable body of scholarly literature. Moreover, it can effectively pinpoint influential research, authors, journals, groups, and nations over time (Van Eck & Waltman, 2010). In this research, the VOSviewer program was used for the bibliometric analysis of publications (VOSviewer, 2023). Figure 2 presents the methodology of the research and workflow steps of this study. The research design was carried out in three main steps. These steps are the following:

- **Step 1: Idea and Data Preparation**

This step was initiated at the beginning of the research; it is important in determining the quantitative research criteria, in which the general lines of the study are established. In this step, the following measures were taken: Generating the Idea, Collecting Data: WOS, and Definition and Source Criteria.

- **Step 2: Data Collection**

In this step, a search was activated for publications between 1975–2023 in the WOS database using the keywords "interior design education*" (Topic) OR "interior design education" (Topic) OR "interior architecture education*" (Topic) OR "interior architecture education" (Topic).

- **Step 3: Data Analysis and Visualization**

Descriptive Bibliometric Analysis: Publications in the WOS database, including author, citation, document type, category, country, affiliations, publication titles, publishers index descriptive bibliometric analysis table count, and percentage were created.

VOSviewer Scientific Mapping: Visualizing scientific landscapes using network visualization, overly visualization, and density visualization.

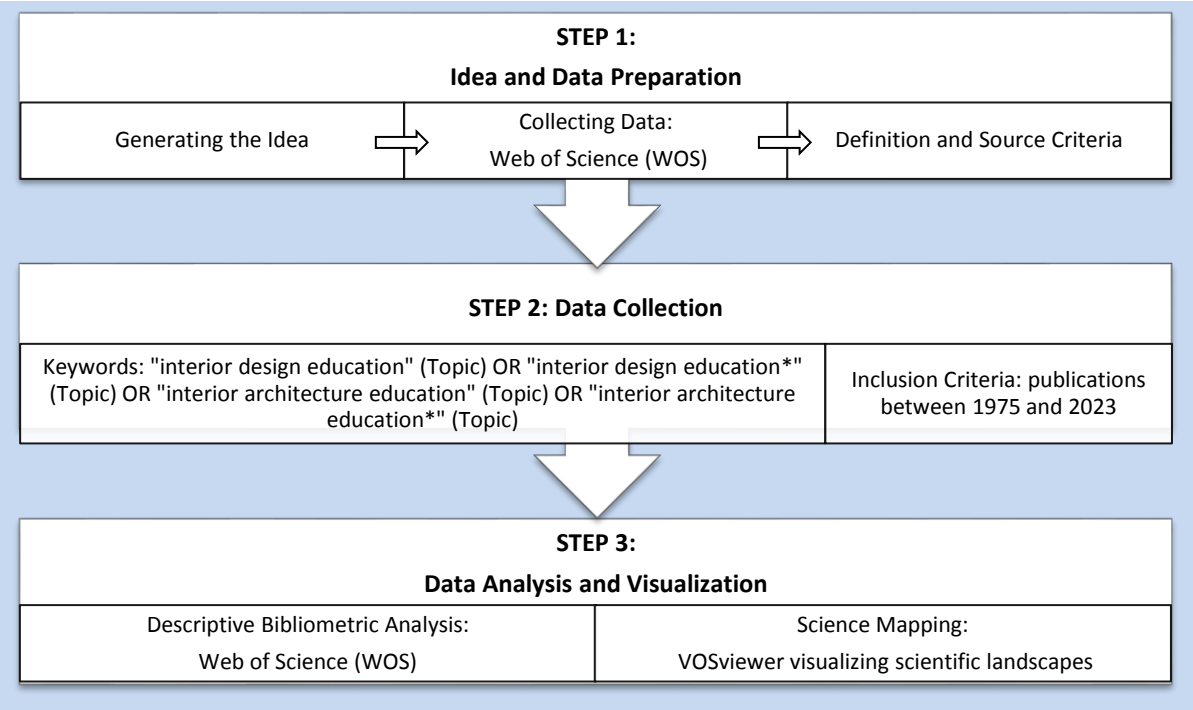

Figure 2. Research methodology and workflow steps

3. Results

3.1. Bibliometric Analysis

Studies examining publications in the field of architecture and interior architecture using the bibliometric analysis method exist in the literature (Chai & Xiao, 2012; Zhao et al., 2019; Yaşar, 2020; Park & Lee, 2022; Burkut & Koseoglu, 2022; Sauve et al., 2022). Bibliometric analyses were made using different databases on publications in architecture and interior architecture. The focuses of this study are publications on interior architecture/design education in the WOS database. Figure 3 shows the number of times these were cited, publications over time, and publications on interior architecture/design education (WOS, 2023).

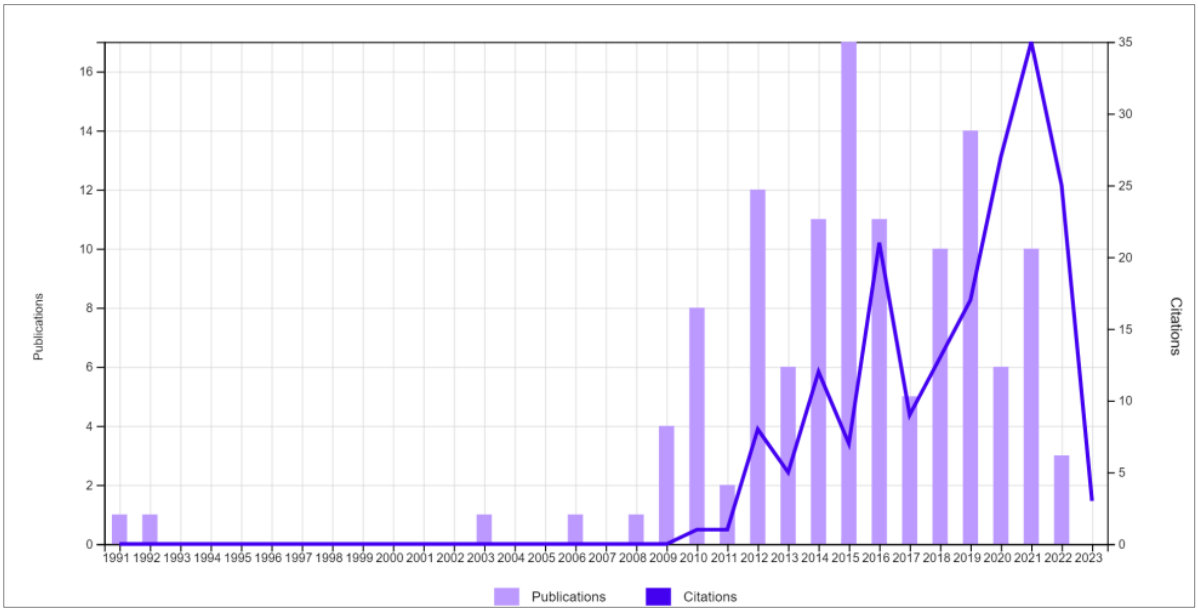

Figure 3. Times cited and publications over time (WOS, 2023)

A citation report of publications on interior architecture/design education can be seen in Figure 3 (WOS, 2023). According to the as seen in Figure 3, the year of citation and publication counts change. According to the WOS database, the most cited author is Zuo, whose citations peak in 2021. In other

words, this author's numbers indicate a high increase over the years with 35 citations and ten publications, followed by Zuo et al., 2010; Demirkan & Demirbas, 2010; Olgunturk & Demirkan, 2009; Afacan, 2016; Cho & Suh, 2019; Dickinson et al., 2012; Islamoglu & Deger, 2015; Afacan, 2012; Stark & Park, 2016; Augustin, 2014. Authors, publication titles, source titles, and publication years can be seen in Table 1 in more detail.

In addition to the works mentioned above, notable research on interior architecture education includes the following topics with their corresponding authors: environmental approach in interior architecture education (Adıgüzel & Ciravoglu, 2013), design studio education (Özker & Makaklı, 2016), oral presentation competency (Hynes & Kwon, 2018), place, environmental embodiment, and architectural sustenance (Seamon, 2015), decolonizing (Hadjinani, 2020), the role of expression techniques (Özker, 2014), and interaction of fashion and interior design styles (Tavsan & Sönmez, 2013). Figure 4 below shows the results of the analysis of the publications in the Web of Science database on interior architecture education (WOS, 2023).

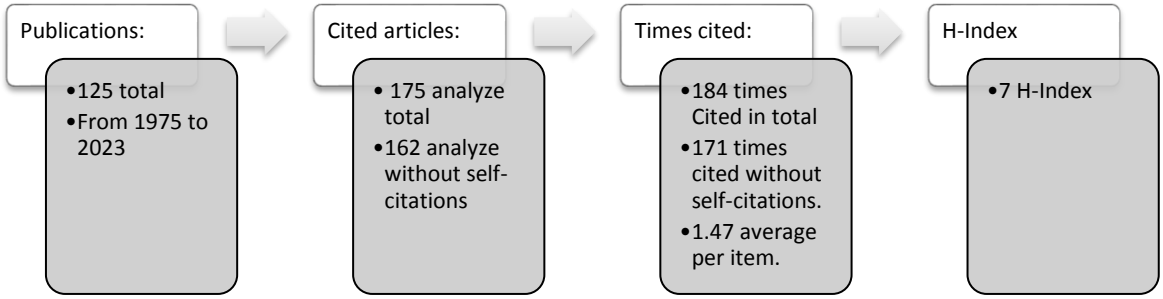

Figure 4. Citation report of publications on interior architecture/design education (WOS, 2023)

Also, the WOS database was searched using the keywords "Interior architecture education" (Topic) OR "interior architecture education*" (Topic) OR "interior design education" (Topic) OR "interior design education*" (Topic) and the results of the most cited publications (listed by number of citations) are shown in Table 1 (WOS, 2023).

Table 1. Most cited publications (listed by number of citations) (WOS, 2023)

Publication Title	Author(s)	Source Title	Year
1) "Integrating Performance-Based Design In Beginning **Interior Design Education**: An Interactive Dialog Between The Built Environment And Its Context"	Zuo et al., (2010)	"Design Studies"	2010
2) "The Effects Of Learning Styles And Gender On The Academic Performance Of Interior Architecture Students"	Demirkan & Demirbas (2010)	"Innovation And Creativity In Education"	2010
3) "Ergonomics And Universal Design In **Interior Architecture Education**"	Olgunturk & Demirkan (2009)	"Metu Journal Of The Faculty Of Architecture"	2009
4) "Exploring The Effectiveness Of Blended Learning In **Interior Design Education**"	Afacan (2016)	"Innovations in Education And Teaching International"	2016
5) "Understanding Spatial Ability İn **Interior Design Education**: 2D-To-3D Visualization Proficiency As A Predictor Of Design Performance"	Cho & Suh (2019)	"Journal Of Interior Design"	2019
6) "A Survey On Practitioner Attitudes Toward Research İn **Interior Design Education**"	Dickinson et al., (2012)	"Journal Of Interior Design"	2012
7) "The Location Of Computer Aided Drawing And Hand Drawing On Design And Presentation in The **Interior Design Education**"	Islamoglu & Deger (2015)	"4th World Conference On Educational Technology Researches (Wcetr-2014)"	2015
8)"Investigating The Effects Of Group Working In Studying **Interior Architecture**"	Afacan (2012)	"World Conference On Design, Arts And Education (Dae-2012)"	2012
9) "The Burnout Phenomenon: A Comparative Study Of Student Attitudes Toward Collaborative Learning And Sustainability"	Augustin (2014)	"Journal Of Interior Design"	2014

10) "**Interior Design** Students Perceptions Of Sustainability"	Stark & Park (2016)	"International Journal Of Sustainability In Higher Education"	2016
11) "Study On Instructional Methods Used in Cad Courses in **Interior Architecture Education**"	Gul (2015)	"International Conference On New Horizons In Education, (Inte 2014)"	2015
12) "Survey On The Use Of Lighting Design Software In Architecture And **Interior Design** Undergraduate **Education**"	Sarawgi (2006)	"International Journal Of Architectural Computing"	2006
13) "Impact Of Covid-19 Lockdown On Design Students' Performance Case Study In The UAE"	Amro (2022)	"International Journal Of Art & Design Education"	2022
14) "Experiential Learning Through Community Co-Design İn **Interior Design** Pedagogy"	Thamrin et al., (2019)	"International Journal Of Art & Design Education"	2019
15) "Comparison Of Conventional And Computer-Aided Drafting Methods From The View Of Time And Drafting Quality"	Ozkan &Yildirim (2016)	"Eurasian Journal Of Educational Research"	2016
16) "Factors İnfluencing Function And Form Decisions Of **İnterior Architectural Design** Studio Students"	Karsli (2015)	"International Conference On New Horizons In Education, (Inte 2014)"	2015
17) "Exploratory And Descriptive Aspects Of Environmental Psychology Course Within The **Interior Design Education**"	Yalcin (2015)	"International Conference On New Horizons In Education, (Inte 2014)"	2015
18) "Build-To-Learn: An Examination Of Pedagogical Practices In **Interior Design Education**"	Konkel (2014)	"Journal Of Interior Design"	2014
19) "Integrating Green Building Approaches To **Interior Architecture Education**: A Cross-Cultural Study"	Pektas et al., (2015)	"Open House International"	2015
20) "The contributions of workshops on formal **interior architecture education"**	Karsli & Ozker (2014)	"Erpa International Congress On Education (Erpa Congress 2014)"	2014

According to Table 1, the most cited publication on interior architecture education is Zuo et al., (2010). Then in order, the researches of Demirkan & Demirbas (2010), Olgunturk & Demirkan (2009), Afacan (2016), Cho & Suh (2019), Dickinson (2012), Islamoglu & Deger (2015) are the most cited publications.

The most recent publications published in the Web of Science database on interior architecture education are; the impact of the Covid-19 pandemic (Kamal Zaubi et. al., 2023), circular economy (Whiting et al., 2023), components of design thinking (Çavuş & Kaptan, 2022), inclusive group work (Fathallah, 2021).

Moreover, the WOS database was searched using the keywords "Interior architecture education" (Topic) OR "interior architecture education*" (Topic) OR "interior design education" (Topic) OR "interior design education*" (Topic) and the results of the document types are shown in Table 2. Accordingly, the most significant number of results was "Proceeding Paper" with 66 publications (52.8%) as a document type. Next, "Article" resulted in 54 publications (43.2%), and "Book Chapters" and "Editorial Material" had three publications (2.4%) each. "Note" and "Review Article" both resulted in one publication (0.8%) (Table 2).

Table 2. Document types (WOS, 2023)

Document types	Result Count	% of 125
Proceeding Paper	66	52.800
Article	54	43.200
Book Chapters	3	2.400
Editorial Material	3	2.400
Note	1	0.800
Review Article	1	0.800

As seen in Table 3, the greatest numbers of publications were published (52.0%) in the "Education Educational Research" category, according to the results linked to WOS category searches. Following this, "Architecture" resulted in 26 publications (20.8%), "Art" in 18 publications (14.4%), "Social Science Interdisciplinary" in 18 publications (14.4%), "Environmental Studies" in six publications (4.8%), and "Environmental Science" in five publications (4.0%). Finally, the "Green Sustainable Science

Technology", "Humanities Multidisciplinary", "Psychology Educational", and "Urban Studies" categories contained three publications each (2.4%) (Table 3).

Table 3. Web of Science categories (WOS, 2023)

Web of Science Categories	Result Count	% of 125
"Education Educational Research "	65	52.000
"Architecture"	26	20.800
"Art"	18	14.400
"Social Science Interdisciplinary"	18	14.400
"Environmental Studies"	6	4.800
"Environmental Science"	5	4.000
"Green Sustainable Science Technology"	3	2.400
"Humanities Multidisciplinary"	3	2.400
"Psychology Educational"	3	2.400
"Urban Studies"	3	2.400

The universities associated with the most publications on interior architecture/design education in the WOS database can be seen in Table 4 and are as follows: İzmir Economy University with nine publications (7.2%), İhsan Dogramacı Bilkent University with eight (6.4%), Karadeniz Technical University with eight (6.4%), and Dogus University and Istanbul Kultur University with five publications each (4.0%) (Table 4).

Table 4. University affiliations (WOS, 2023)

Affiliations	Result Count	% of 125
İzmir Economy University	9	7.200
İhsan Dogramacı Bilkent University	8	6.400
Karadeniz Technical University	8	6.400
Dogus University	5	4.000
Istanbul Kultur University	5	4.000

The journal "Procedia Social and Behavioral Sciences" has 25 publications (20.0%), the "Journal of Interior Design" has 12 (9.6%), "Inted Proceedings" has 10 (8.0%), "Iceri Proceedings" has five (4.0%), and the "International Conference on New Horizon in Education (INTE)-2014" and "Turkish Online Journal of Design Art and Communication" both have five each (4.0%) (Table 5).

Table 5. Publication titles (WOS, 2023)

Publication Titles	Result Count	% of 125
"Procedia Social and Behavioral Sciences"	25	20.000
"Journal of İnterior Design"	12	9.600
"Inted Proceedings"	10	8.000
"Iceri Proceedings"	5	4.000
"International Conference on New Horizon in Education (INTE)-2014"	5	4.000
"Turkish Online Journal of Design Art and Communication"	5	4.000

In terms of publishers, "Elsevier" resulted in 27 publications (21.6%), "Wiley" in 20 (16.0%), "(IATED)-Int Assoc. Technology in 16 (12.8%), and "Education & Development" in nine (7.2%) (Table 6).

Table 6. Publishers (WOS, 2023)

Publishers	Result Count	% of 125
"Elsevier"	27	21.600
"Wiley"	20	16.000
"(IATED)-Int Assoc. Technology, Education & Development"	16	12.800
"(IATED)-Int Assoc. Technology, Education A& Development"	9	7.200

For the countries/regions search, Türkiye resulted in 69 publications (55.2%), the USA in 25 (20.0%), China in seven (5.6%), and the United Arab Emirates in six (4.8%) (Table 7).

Table 7. Countries/regions (WOS, 2023)

Countries/Regions	Result Count	% of 125
Turkiye	69	55.200
USA	25	20.000
China	7	5.600
United Arab Emirates	6	4.800

The WOS Index contained the following: "Conference proceedings citation index-Social Science & Humanities (CPCI-SSH)" had 62 publications (49.6%), "Emerging Sources Citation Index (ESCI)" had 25 (20.0%), "Arts and Humanities Citation Index (A&HCI)" had 23 (18.4%), "Social Sciences Citation Index (SSCI)" had 12 (9.6%), "Conference Proceedings Citation Index-Science (CPCI-S)" had six (4.8%), "Science Citation Index Expanded (SCI-Expanded)" had five (4.0%), and the "Book Citation Index-Social Sciences & Humanities (BKCI-SSH)" had three (2.4%) (Table 8).

Table 8. Web of Science Index (WOS, 2023)

Web of Science Index	Result Count	% of 125
"Conference proceedings citation index-Social Science & Humanities (CPCI-SSH)"	62	49.600
"Emerging Sources Citation Index (ESCI)"	25	20.000
"Arts and Humanities Citation Index (A & HCI)"	23	18.400
"Social Sciences Citation Index (SSCI)"	12	9.600
"Conference Proceedings Citation Index-Science (CPCI-S)"	6	4.800
"Science Citation Index-Expanded (SCI-EXPANDED)"	5	4.000
"Book Citation Index-Social Sciences & Humanities (BKCI-SSH)"	3	2.400

3.2. Science Mapping Analysis

Bibliometric analysis is a practical technique for discovering and assessing literature research, as well as developing a system for examining it to uncover publication trends and patterns. Bibliometric reviews have become a popular field of study as many studies have been published in almost every area of knowledge (Chai & Xiao, 2012; Zhao et al., 2019; Yaşar, 2020; Park & Lee, 2022; Burkut & Koseoğlu, 2022; Sauve et al., 2022; Abd Aziz et al., 2022). Therefore, this review aims to contribute significantly to advancing science and the execution of interior architecture/design education. Bibliometric networks can be analyzed with VOSviewer software. There are several advanced features available for building bibliometric networks (e.g., co-authoring, bibliographic matching, and co-citation networks). Furthermore, by employing a fractional counting approach, the impact of multi-author, multi-citation, or multi-reference publications can be minimized. Thesaurus files can be used to tidy up data.

Science mapping of data obtained from databases such as WOS, Scopus, Dimensions, Lens, and PubMed is done with VOSviewer software programs. Co-authoring networks, citation-based networks, and co-occurrence networks can be created based on data downloaded from WOS, Scopus, Dimensions, LensCrossref, Europe PMC, and OpenAlex (Figure 5). Also, networks can be built based on data received via Crossref, Semantic Scholar, OpenCitations and WikiData, Europe PMC, and OpenAlex APIs. These APIs can be queried interactively in VOSviewer.

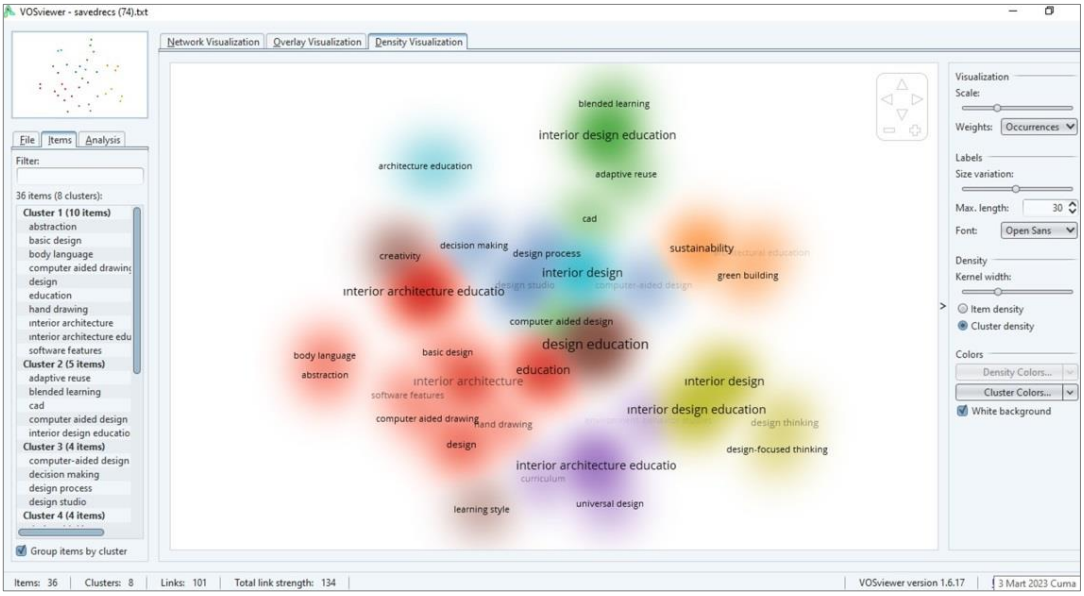

Figure 5. VOSviewer software interface

Network visualization analysis; is represented by a circle in which the elements appear with their names. The stronger the connection of this element with other elements, the larger the circle. The lines between the circles represent connections. In addition, the color of the items varies according to the subsets in which the items are located. Overlay visualization analysis creates the same visual as network visualization, except for its colors. The color of the items is determined by the scores of the items. The item with the lowest score is shown in blue and the item with the highest score is shown in yellow. Information about these colors is given in the lower right part of the analysis. Density visualization analysis can be analyzed in two different ways. The first of these is item density and the other is cluster density. Each dot in the element density visualization changes colors from blue to green to yellow, indicating the density of elements at that point.

The results of the analysis type titled co-occurrence, a unit of analysis: author keywords in the VOSviewer program are presented in Figure 6, the data of the most used words by authors in the publications on interior architecture education. Additionally, the network visualization category can be observed in the cluster (36 items) network visualization as seen in Figure 6, overly visualization between 2000 to 2020 as seen in Figure 7, and density visualization white background cluster density are also presented as seen as in Figure 8.

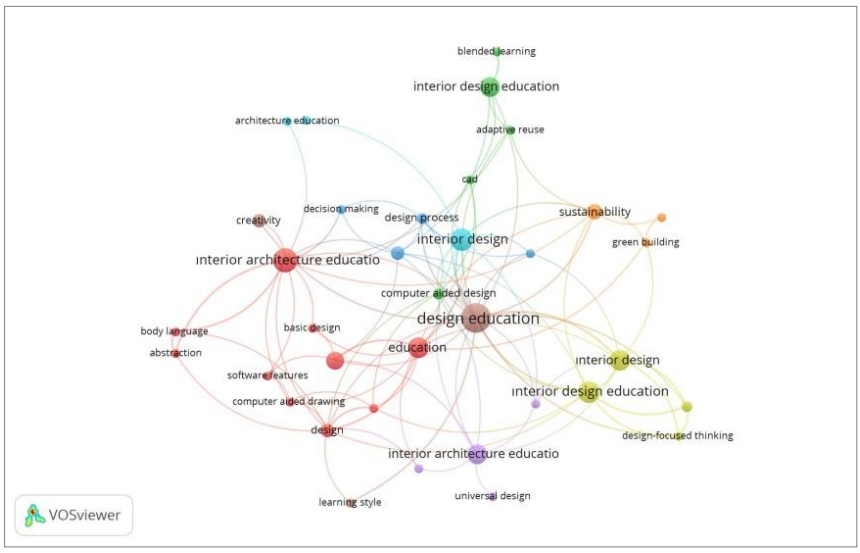

Figure 6. Type of analysis: co-occurrence, the unit of analysis: author keywords. Network visualization (min: 2)

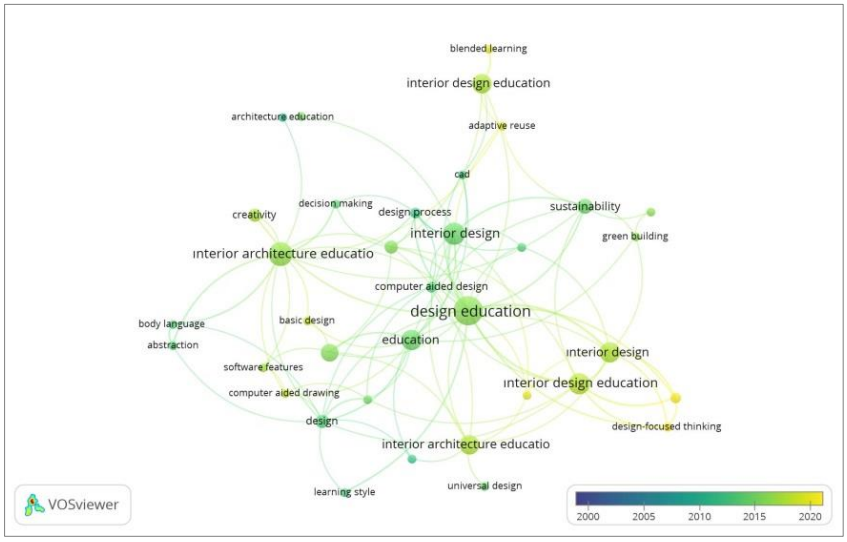

Figure 7. Type of analysis: co-occurrence, unit of analysis: author keywords. Overlay visualization 2000–2020 (min: 2)

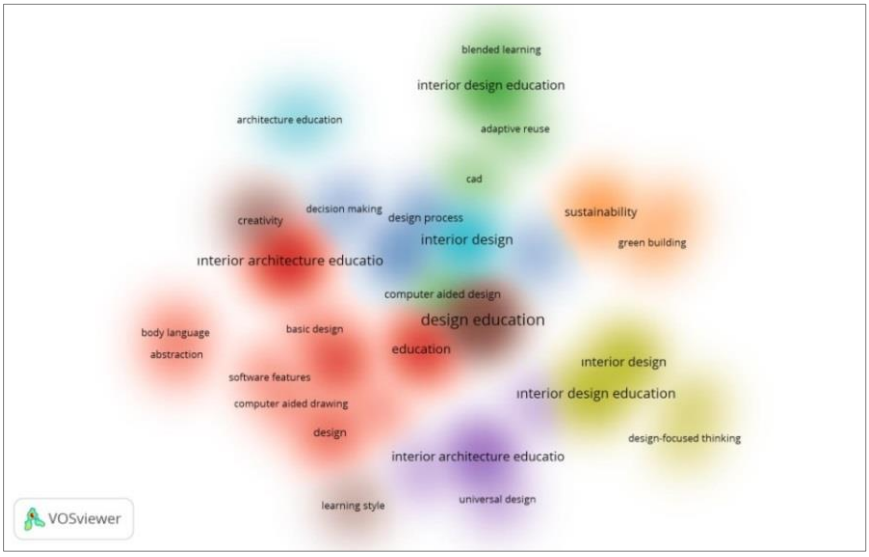

Figure 8. Type of analysis: co-occurrence, unit of analysis: author keywords. Density visualization (min: 2)

As seen as in Table 9 cluster and items of keywords that authors use most in their publications. According to the results of the Type of Analysis: Co-occurrence / Unit of Analysis: Author keywords in the VOSviewer software program, the sets of the most used words by the authors were created (Table 9).

Cluster 1: Abstraction, Basic design, Body language, Computer aided drawing, Design, Education, Hand drawing, Interior architecture, Interior architecture education, Software features.
Cluster 2: Adaptive reuse, Blended learning, Cad, Computer aided design, Interior design education.
Cluster 3: Computer aided-design, Decision making, Design process, Design studio.
Cluster 4: Design thinking, Design-focused thinking, Interior design, Interior design education.
Cluster 5: Curriculum, Environment-behavior studies, Interior architecture education, and Universal design.
Cluster 6: Architecture education, Interior design, Studio teaching
Cluster 7: Architectural education, Green building, Studio teaching.
Cluster 8: Creativity, Design education, and Learning style

Table 9. Clusters and items of keywords that authors use most in their publications

	Cluster 1 (red) (10 items)	**Cluster 2 (green) (5 items)**	**Cluster 3 (blue) (4 items)**	**Cluster 4 (yellow) (4 items)**
Keywords	Abstraction Basic design Body language Computer-aided drawing Design Education Hand drawing Interior architecture Interior architecture education Software features	Adaptive reuse Blended learning Cad Computer-aided design Interior design education	Computer aided-design Decision making Design process Design studio	Design thinking Design-focused thinking Interior design Interior design education
	Cluster 5 (purple) (4 items)	**Cluster 6 (turquoise) (3 items)**	**Cluster 7 (orange) (3 items)**	**Cluster 8 (brown) (3 items)**
Keywords	Curriculum Environment-behavior studies Interior architecture education Universal design	Architecture education Interior design Studio teaching	Architectural education Green building Studio teaching	Creativity Design education Learning style

Also, according to Figure 9, design education is at the center of the network map. Also, the relationship between design education and red, green, blue, yellow, purple, turquoise, orange, and brown clusters and keywords are shown in Figure 9.

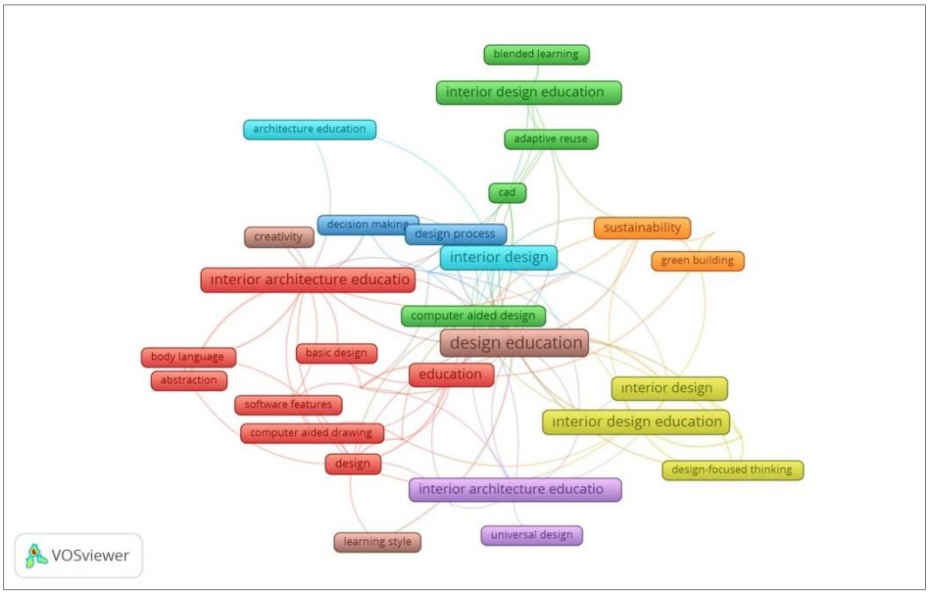

Figure 9. Type of analysis: co-occurrence, unit of analysis: author keywords

As seen in Figure 10, using VOSviewer program results of the type of analysis: bibliographic coupling, unit of analysis: sources (min: 1) and as seen as in Figure 11 (min:2) most effective sources in publications on interior architecture education; “Journal of Interior Design”, “Anadolu University Journal of Art and Design”, “Open House International”, “International Journal of Art & Design Education “, “ICONARP International Journal of Architecture and Planning”, “Turkish Online Journal of Design Art and Communication”, “Megaron” and “METU Journal of the Faculty of Architecture”.

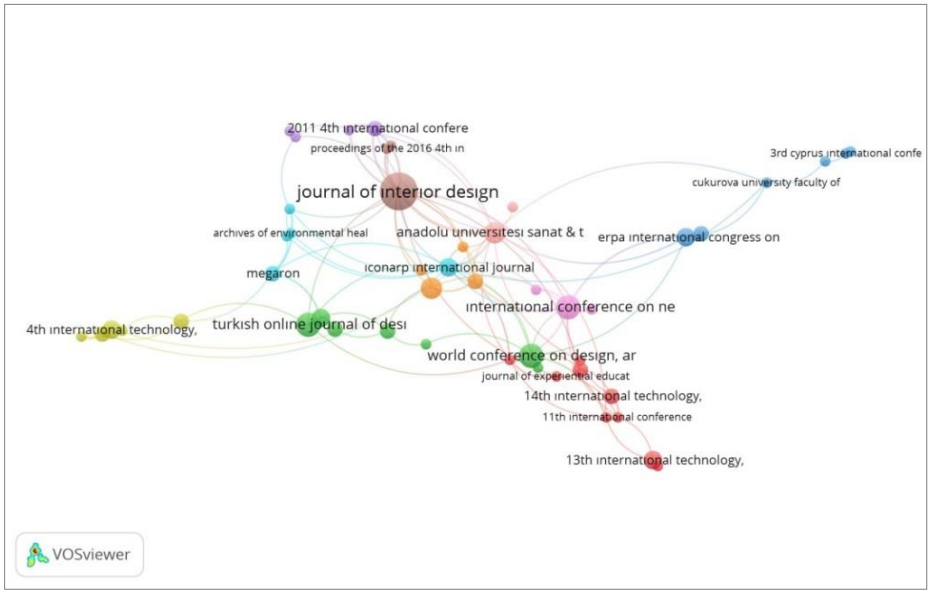

Figure 10. Type of analysis: bibliographic coupling, unit of analysis: sources (min: 1)

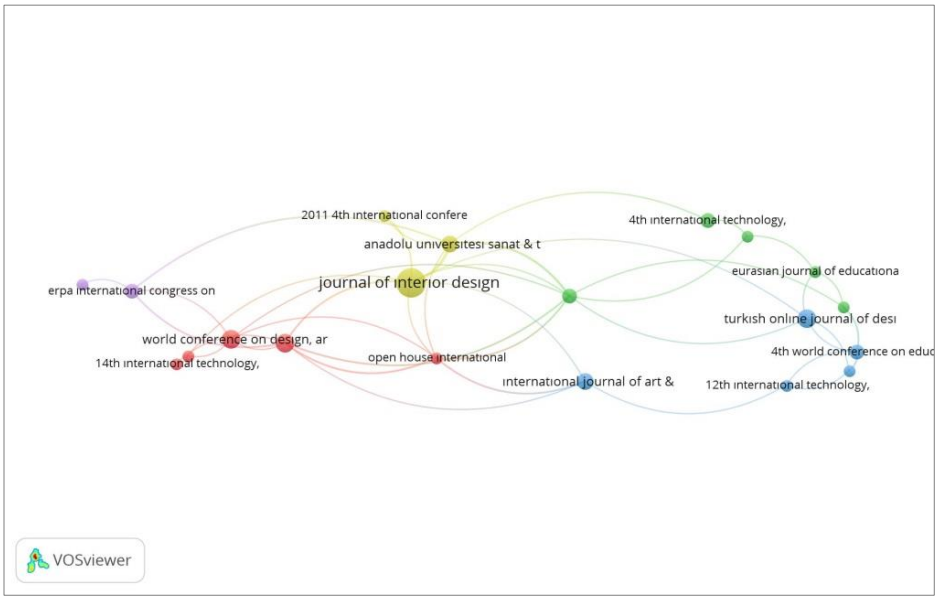

Figure 11. Type of analysis: bibliographic coupling, the unit of analysis: sources (min: 2)

To sum up, Buzan & Buzan (2002), Buzan (2006), and Edvards & Cooper (2010) asserts that mind mapping is a tool that provides us with the necessary knowledge to comprehend complex ideas simply. The mind is prepared by the mind mapping technique so that information may be used to create an image in the brain logically and imaginatively. With the mind mapping technique, the linear view is described first, followed by the core concept. It is helpful for oneself and groups as well, when it can be more effective than written reviews. As seen in Figure 12, the mind maps of publications on interior architecture education using data from the Web of Science database. It was created by the author according to the data of the documents published until 2023.

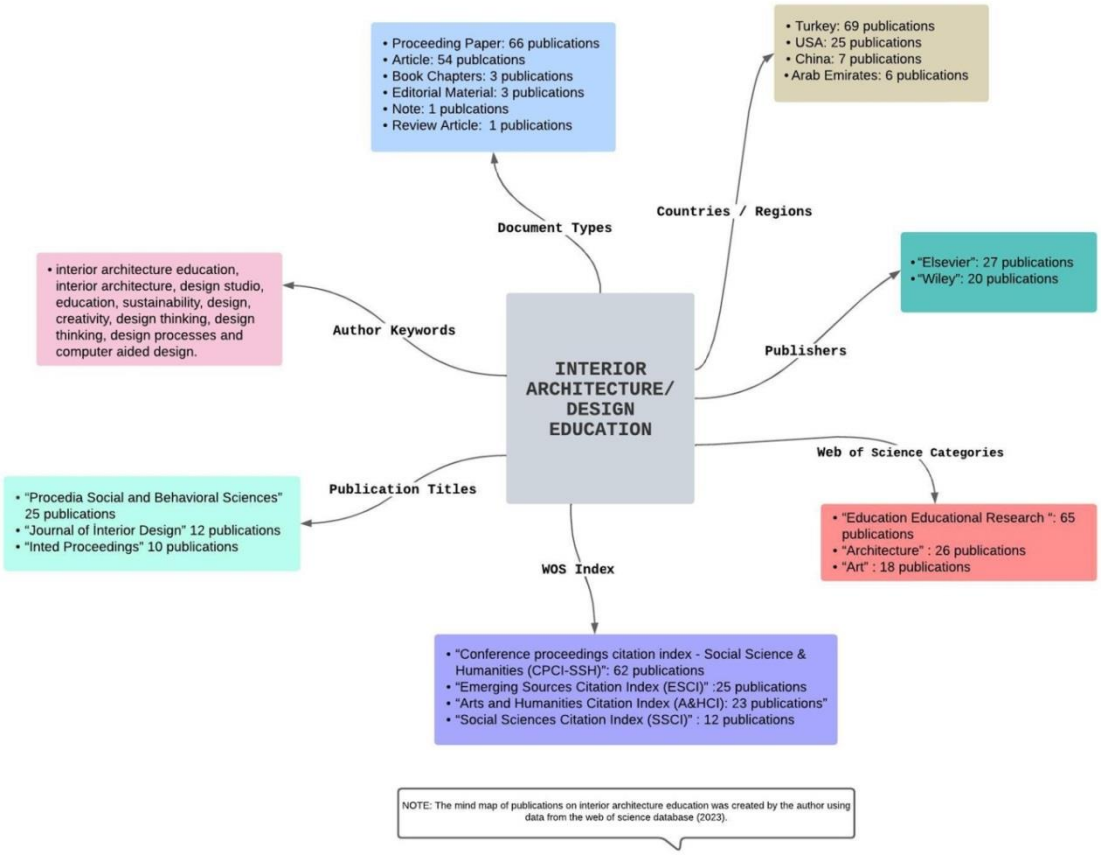

Figure 12. The mind map of publications on interior architecture education was created by the author using data from the Web of Science database (2023)

In Figure 13, a visual analysis of WordCloud (keywords plus used at the highest frequency) of the publications on interior architecture education published in web of science was made with the R Studio Biblioshiny software program. Accordingly, the most notable words are; education, design, studio, creativity, perception, communication, experience, model, impact, sustainability (Figure 13). Figure 14 is a visualization of the word cloud of the most used words by the authors. This word cloud was visualized by the author with Biblioshiny software (Figure 14).

Figure 13. The WordCloud of publications "keywords plus" on interior architecture education was created by the author using R Studio Biblioshiny software program (2023)

Figure 14. The WordCloud of publications "authors' keywords" on interior architecture education was created by the author using R Studio Biblioshiny software program (2023)

Figure 15 The Thematic Map of publications "authors' keywords" (density/centrality) on interior architecture education was created by the author using R Studio Biblioshiny software program. According to Figure 15 Development degree (Density) / Relevance degree (Centrality) is seen in Figure a) Motor themes; "interior architecture education", "education", "interior architecture", b) Basic themes; "interior design", "interior design education", "design education"; c) Emerging or Declining themes; "universal design", d) Niche themes; "blended learning", "design performance", "interior design studio". As seen in Table 10 the Thematic Map of publications "authors' keywords" clusters frequency analysis.

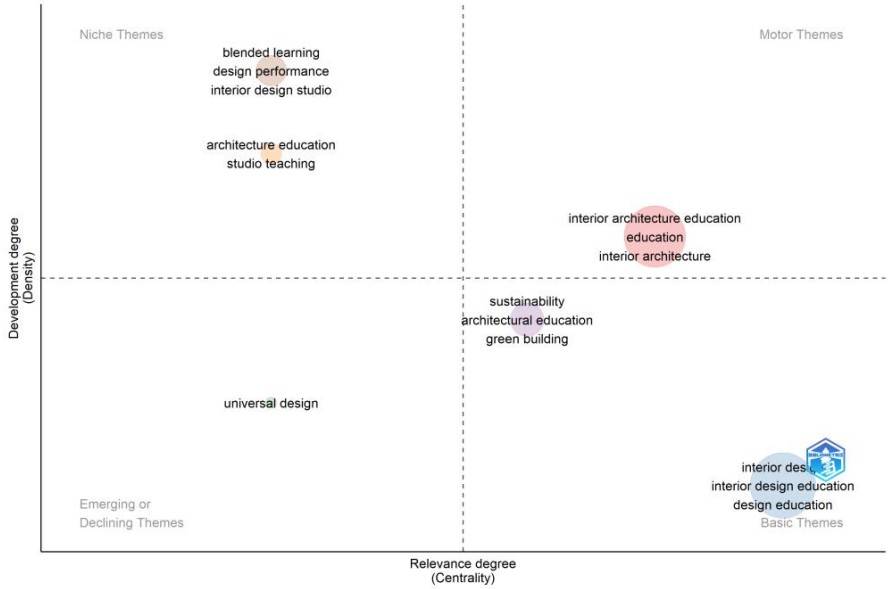

Figure 15. The Thematic Map of publications "authors' keywords" (density/centrality) on interior architecture education was created by the author using R Studio Biblioshiny software program (2023)

Table 10. The Thematic Map of publications "authors' keywords" clusters frequency analysis was created by the author using R Studio Biblioshiny software program (2023)

Cluster	Callon Centrality	Callon Density	Rank Centrality	Rank Density	Cluster Frequency
interior architecture education	0,4249091	57,25531506	5	4	71
interior design	0,7596728	41,51443363	6	1	97
universal design	0	50	2	2	2
sustainability	0,0833333	52,77777778	4	3	10
architecture education	0	62,5	2	5	4

Conclusion and Suggestions

Interior architecture/design education aims to develop and implement functional, aesthetic, sustainable, and original designs that will respond to the needs of users by evaluating the possibilities of developing technology with its human-oriented approach. In order to create healthy, comfortable, and sustainable living spaces, designing spatial elements and ensuring the unity of indoor and outdoor arrangements are also among the main topics of the department, not only limited to the interior space. This article examines searches in the WOS database related to interior architecture/design education. This research is important in evaluating the publications on interior architecture education and observing which publications exist. It also reveals deficiencies related to publications in the literature on interior architecture education. The research was solely conducted in the WOS database.

In summary, the most influential and most cited authors on interior architecture education are Zuo et al. (2010), the most frequent document type is the “proceeding paper”, and the "Education Educational Research" publication type is the most common category type. Influential journal titles include “Procedia Social and Behavioral Sciences”, the most influential publisher is “Elsevier”, the country with the most publications in the countries/regions category search is Türkiye, and the most significant number of publishers can be found in the WOS Index “Conference proceedings citation index-Social Science & Humanities (CPCI-SSH)”. In addition to these results, the words most frequently used by authors are “interior architecture education”, “interior architecture”, “design studio”, “education”, “sustainability”, “design”, “creativity”, “design thinking”, “design processes” and “computer-aided design”.

This study summarizes the findings of a bibliometric review of the literature on interior architecture education and presents a quantitative description of the dominant pattern in this field of study. However, there are limitations to the analysis technique and classification of records that must be considered. This study made use of WOS as a search tool. However, it is important to note that bibliometric reviews can also be performed using Google Scholar or various databases such as Scopus, PubMed, and ERIC. When specific keywords are searched in different databases using multiple combinations, additional or different detailed results can be accessed. Therefore, in the future, a more comprehensive study of interior architecture/design education can be performed using a separate database.

Acknowledgments and Information Note

The article complies with national and international research and publication ethics. Ethics committee permission was not required for the study.

Author Contribution and Conflict of Interest Declaration Information

The article has a single author and there is no conflict of interest.

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