Bibliometric Analysis: An Example of Journal Publishing on Furniture and Wood Materials

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ABSTRACT

Bibliometric analysis is a literature review tool, and with this technique, the status of the analyzed field or journal is determined, its development course is revealed and deficiencies are identified. In this study, it is aimed to make a bibliometric analysis of the "Furniture and Wooden Material Research Journal", which makes research on furniture and wood materials, in terms of various criteria. The scope of the research consisted of 72 academic studies published to journal. According to the results obtained, all publications in the journal were written by Turkish researchers. Research in the Journal was predominant by team research. Mostly researchers working at Kahramanmaraş Sütçü İmam University, Bayburt University and İzmir Katip Çelebi University published in the journal. The number of articles written in English is very few. 50% of the articles published in the journal were not cited. The most frequently used keywords were "wood or wood material" and "surface roughness". It has been determined that the studies in the journal comply with Price Law and the 80/20 rule, but do not comply with Lotka's Law. Based on these results, the journal can develop certain academic criteria.

Anahtar Kelimeler: Bibliometric analysis, Furniture and wood material, Qualitative research

Bibliyometrik Analiz: Mobilya ve Ahşap Malzemeler Üzerine Yayın Yapan dergi Örneği

Öz

Bibbliyometrik analiz bir literatür tarama aracıdır. Bu analiz sayesinde analiz edilen alanın ve derginin durumu belirlenir, gelişim seyri ortaya çıkarılır, eksikliklier tespit edilir. Bu çalışmada, mobilya ve ahşap malzemeler üzerine araştırmalar yapan "Mobilya ve Ahşap Malzeme Araştırmaları Dergisi'nin" çeşitli kriterler açısından bibliyometrik analizinin yapılması amaçlanmıştır. Araştırmanın kapsamını dergide yayınlanan 72 akademik çalışma oluşturmaktadır. Elde edilen sonuçlara göre, dergideki tüm yayınlar Türk araştırmacılar tarafından yazılmıştır. Mobilya ve Ahşap Malzeme Araştırmalar Dergisi'nde araştırma ağırlıklı olarak ekip araştırmasıdır. Dergide çoğunlukla Kahramanmaraş Sütçü İmam Üniversitesi, Bayburt Üniversitesi ve İzmir Katip Çelebi Üniversitesi'nde görev yapan araştırmacılar dergiye katkıda bulunmuştur. İngilizce olarak yazılan makale sayısı oldukça azdır. Dergide yayınlanan makalelerin %50'sine atıf yapılmamıştır. En sık kullanılan anahtar kelimeler "ahşap veya ahşap malzeme" ve "yüzey pürüzlülüğüdür". Dergide yer alan çalışmaların Price Kanunu ve 80/20 kuralına uygun olduğu, Lotka Kanunu'na ise uygun olmadığı tespit edilmiştir.. Bu sonuçlara dayanarak dergide belirli akademik kriterler geliştirebilir.

Keywords: Bibliyometrik analiz, Mobilya ve ahşap malzemeler, Nitel araştırma

I. INTRODUCTION

The furniture industry is one of the oldest and developing sectors in Turkey. The Turkish furniture industry was dominated by workshop-type businesses, most of which worked with traditional methods. In recent years, in the face of increasing competition, the number of medium and large-scale enterprises producing at world standards has begun to increase, and furniture companies have become in a position to sell products to both domestic and international markets. The furniture industry has a very wide range of products, and the furniture industry covers the production of raw materials such as MDF and chipboard, chemicals such as paint and adhesive and accessories, the production of machines used in furniture production and all the design stages of furniture. When we look at the furniture industry from this broad perspective, it can be seen how wide the employment opportunities the furniture industry provides. Moreover, the furniture industry is one of the leading sectors of our country in terms of added value and continues to increase its contribution to the economy as one of the sectors that uses domestic resources the most in exports and has the least dependence on imported products [1,2]. Scientific journals are one of the most important sources that help consumers get information about furniture, which has a wide variety of products and whose demand is constantly increasing. Scientific journals contribute to the furniture industry in proportion to the quality and quality of the articles they publish. Furniture and Wooden Materials Research Journal is the first academic journal to start publishing in Dergipark, prioritizing the furniture issue. One of the techniques used to determine the qualities of scientific journals is bibliometric analysis [3,4].

Bibliometrics is a research field and method that examines various elements of the information produced and quantifies the distribution. Bibliometrics was first introduced in 1926. Alfred Lotka's models of author productivity were examined and initial rules for bibliometrics (Lotka's law) were provided. Research by Samuel Bradford in 1934 led to a fundamental law of bibliometrics (Bradford's law). In the study, the frequency distribution of scientific publications in journals in certain research areas was analyzed. In 1955, Eugene Garfield developed the Science Citation Index, which is considered the beginning of the modern era of bibliometrics. The term bibliometrics was first used by Alan Pritchard in 1969. Before Pritchard, this term was used by E. Wyndham Hulme in 1923 and Raisig L. Miles in 1962 under the name Statistical Bibliography [5 -7].

The most preferred method to determine the qualifications of scientific journals is the Bibliometric Analysis method. Bibliometric analysis has gained immense popularity in business research in recent years [8]. The reasons why bibliometric analysis is so popular are: (1) The progress, usability and accessibility of bibliometric software such as Gephi, Leximancer, VOSviewer and scientific databases such as Scopus and Web of Science, (2) the cross-disciplinary pollination of the bibliometric methodology from information science to business research [8].

Bibliometric studies are studies based on document analysis that allow the analysis of publications in a field with different methods and the evaluation of scientific studies. Bibliometric studies rely on a limited set of bibliometric data and techniques, and these studies only occur when they provide a piecemeal understanding of the area under investigation. The study, which was carried out within the scope of bibliometric studies in 1927 and in which the bibliographies of the articles published in the Journal of the American Chemical Society were evaluated, is considered to be the first study In Turkey, the book "Growth in Turkish Positive Basic Sciences", published by Ahmet Kemal Özinönü in 1970, is seen as the pioneer of studies conducted within the scope of bibliometric studies [9 – 11].

Bibliometric analysis of scientific studies is usually carried out by analyzing the theses in the field or a selected journal. In this context, it is seen that bibliometric analyzes of selected journals in different fields are made.

Cancino et al. [12] conducted a bibliometric analysis of Computers and Industrial Engineering (CIE), which an international journal in the field of industry and started broadcasting in 1976. As a result of

the study, the leading tendencies of the journal were identified in terms of impact, topics, universities and countries.

Zeleznik et al. [13] examined the publication characteristics and development of the Journal of Advanced Nursing, which has a publication life of 40 years. For this, descriptive bibliometry was used. Also, bibliometric mapping was used to identify the most productive research terms and themes in the journal and their evolution over time. It has been determined that this research reveals a positive trend in literature production. But, the number of articles published in the journal was decreased a little recently. As a result of the thematic analysis, it was determined that the most productive themes correspond to the main aims and scope of the journal.

Abdi et al. [14] presented a bibliometric analysis of 2913 articles in the Journal of Information Processing and Management. In the study, the 10 most productive authors, the 10 most productive institutions and the 24 countries with the most publications were determined in terms of the number of articles.

According to Polat et al. [15] conducted a bibliometric analysis of 188 scientific articles published by the Journal of Harita among 2000 and 2017. As a result of the analysis, when the citations made by the articles were examined, foreign journals and works were quite high. Citations to the journal from foreign sources were very few.

Uribe-Toril et al. [16] performed a bibliometric analysis of 2094 articles, reviews, editorials, and corrections in the Forests. In the study, the countries, authors and institutions involved with the subjects related to forest knowledge areas were determined. The results indicate that the United States of America, China and Canada are the most active countries in Forests and this journal reached 105 countries. Contributions and citations to the journal have been increasing continuously since 2014.

The article of Wang et al. [17] presented a bibliometric analysis of Economic Research-Ekonomska Istra Zivanja from 2007 to 2019. As a result of the analysis, 831 articles were examined in the study and the number of publications of the journal increased steadily. Zavadskas E.K. was the most contributed to the journal. Lithuania was the most influential country whereas the most productive country was Croatia. The most contributing institutions to the journal were found to be the University of Zagreb (Croatia), University of Ljubljana (Slovenia) and Juraj Dobrila University of Pula (Croatia).

Kırdar and Benli [18] conducted a bibliometric analysis of 138 articles published in the Journal of Social Security between 2011-2019. As a result of the investigations; individual studies are preferred. The first three institutions that contributed the most are Hacettepe University, Ankara University and Gazi University. The vast majority of articles were written by members at university. Journals, books and other sources were preferred as source type, respectively. A total of 830 citations were made to the Social Security Journal. Most of the articles were written in Turkish.

Donthu et al. [19] conducted a bibliometric analysis of the Journal of Business Research (JBR). Using the network analysis in OSviewer software, JBR publications were categorized into six clusters. The co-authorship and bibliographic couplings of authors and their affiliated institutions and countries, co-citations of journals, and cooccurrence of author-specified keywords were analyzed through Gephi software.

In another study by Donthu et al. [8] in 2021, it was aimed to analyze how the International of Journal Information Management developed in terms of various quantitative parameters. For this, bibliometric analysis was used.

Other studies on bibliometric analysis of journals are as follows: Journal Indian Forester [20], Sustainability [21], European Journal of Marketing [22], Periodontology 2000 [5], Journal of Management Research and Analysis [23], Business Strategy and the Environment [24], International Journal of Bank Marketing [25], Journal of Travel and Hotel Business [26], Istanbul University

Journal of Geograph [27], Journal of Erciyes University Faculty of Veterinary Medicine [28], Third Sector Social Economic Review [29], Journal of Corporate Real Estate [30].

II. MATERIAL AND METHOD

Bibliometric analysis is an approach that uses a range of quantitative methods to measure, track and analyze scientific literature [31]. With bibliometric analysis, which is used as a literature review tool, the status of the analyzed field or journal is determined, and as a result, its course of development is revealed and deficiencies are identified [32].

In this study, the articles in the Furniture and Wooden Material Research Journal, published between 2018 and 2022, were analyzed using the bibliometric technique, which has qualitative features in terms of the technique of obtaining data and quantitative features in terms of presentation of data. The data collection process of the research was carried out between 20 and 30 April, 2023. Journal of Furniture and Wood Material Research (MAMAD) is a peer-reviewed and scientific journal published regularly twice a year, in June and December. The first issue of the journal was published in 2018. The aim of the journal is to provide service to all readers who are interested in furniture and wooden materials. Publication languages of journal are Turkish and English. It is scanned by TR INDEX, Index Copernicus International Word of Journals, Index Copernicus International Journals Master List, ERIH PLUS, Crossref, EBZ index, DRJI, CosmosIF, ResearchBib, SJIFactor, General Impact Factor, CiteFactor, Citefactor impact factor, Sindex, ZDB, Eurasian Scientific Journal Index, BASE, Idealonline, ASOS index and ISSN [4]. Within the scope of bibliometric analysis of articles in Furniture and Wooden Material Research Journal, answers to the following questions are sought.

- What is the distribution of articles published in the journal by years?
- What is the multi-authorship status of the articles in the journal?
- What are the institutions where the authors who publish in the journal work?
- Which universities contribute the most to the journal?
- What are the most frequently used keywords in the articles in the journal?
- What is the language of publication in the articles published in the journal?
- What is the page number distribution of articles published in the journal?
- What is the distribution of reference number of articles published in the journal?
- What are the types of research that refer to articles published in the journal and what is their distribution by year?
- What are the names and index types of the articles that refer to the articles published in the journal?
- Do the articles published in the journal comply with the Pareto, Price and Lotka laws?

III. RESULTS

72 articles published in the journal in a five-year period were analyzed. 93% of these articles were research articles (67) and 7% were review articles (5). As seen in Figure 1, the number of articles was similar in the first three years, but increased in 2021.The average number of articles per year was calculated as 14.4. Accordingly, 27.8% of the articles published in the journal in 5 years belong to 2021.

72 articles were produced by 76 different authors, 20 authors had two or more articles, and 56 authors had only one article. It was determined that the number of authors in the articles varied from1 to 4, 38.89% of the articles had one author, 37.5% had two authors, 18.06% had three authors and 5.56% had four authors (Figure 2). The degree of cooperation in the articles was calculated with the help of the following formula [33].

$$C = \frac{N_m}{N_m + N_s} \qquad (1)$$

Where, C is degree of collaboration in the discipline, N_m is number of multi-authored papers and N_s is number of single authored papers.

The C value was calculated as 0.61 with the above formula. The higher the C value, the higher the level of cooperation. The degree of collaboration calculated in the study shows that research in the Furniture and Wooden Material Research Journal is predominant by team research. It is seen that the degree of collaboration in the Furniture and Wooden Material Research Journal varies from 0.33 to 0.83 in terms of the years.
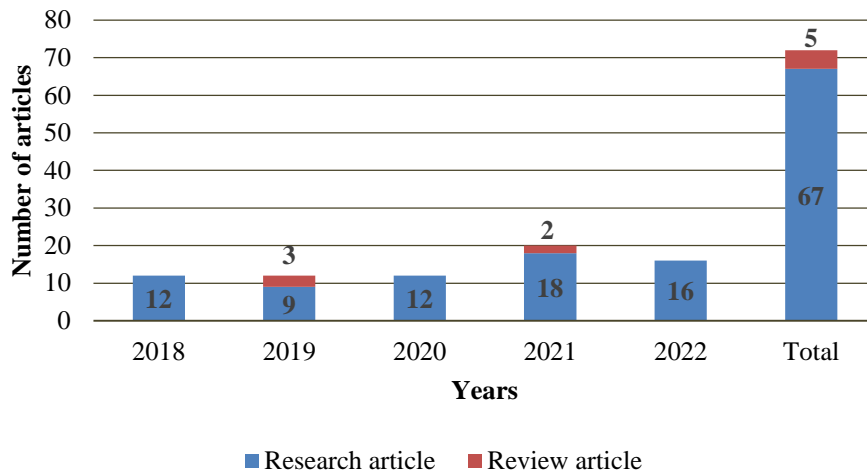

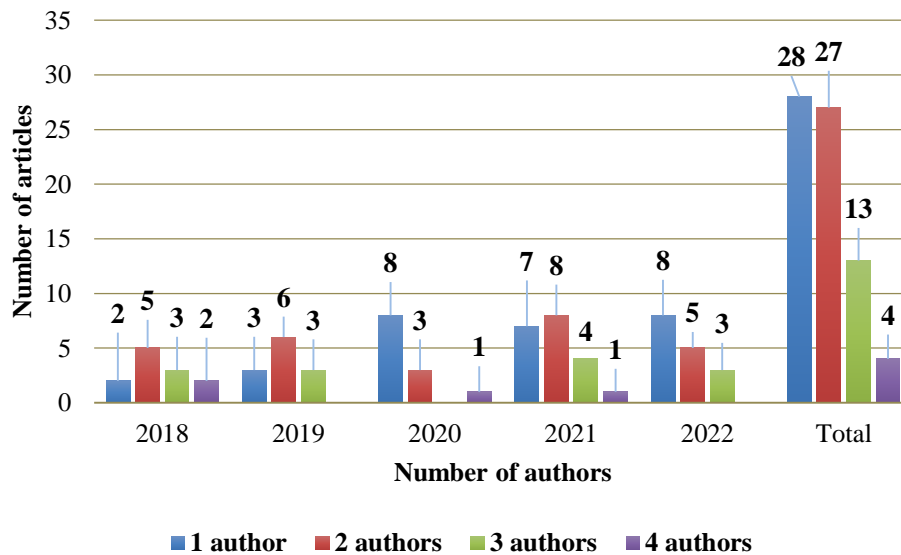*Fig. 1. Distribution of articles by years*

Fig.2. Distribution of articles by number of authors

It was concluded that the authors of the articles published in the journal between 2018 and 2022 worked in different institutions. The distribution of authors by institutions is given in Figure 3. According to Figure 3, the institutions that contribute the most are universities. Authors working in public institutions (national education) and private sector contributed to the journal. Postgraduate students also contributed to the journal. The distribution of universities contributing the most to the articles was given in Figure 4. Considering Figure 5, it was seen that 25 different universities contributed to the articles. The top five universities that contributed the most to the journal are:

Kahramanmaraş Sütçü İmam University (14 articles), Bayburt University (10 articles), İzmir Katip Çelebi University (9 articles), Kütahya Dumlupınar University (8 articles) and Kastamonu University (7 articles).
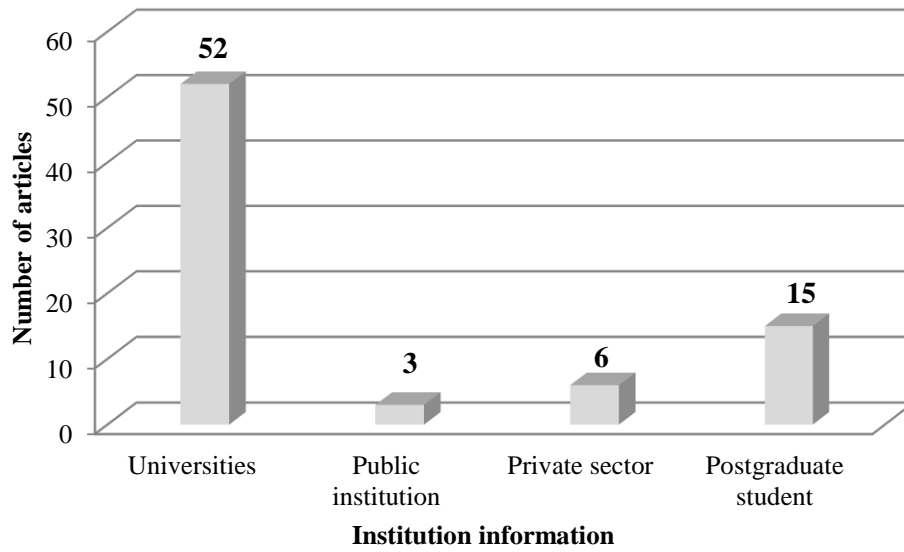

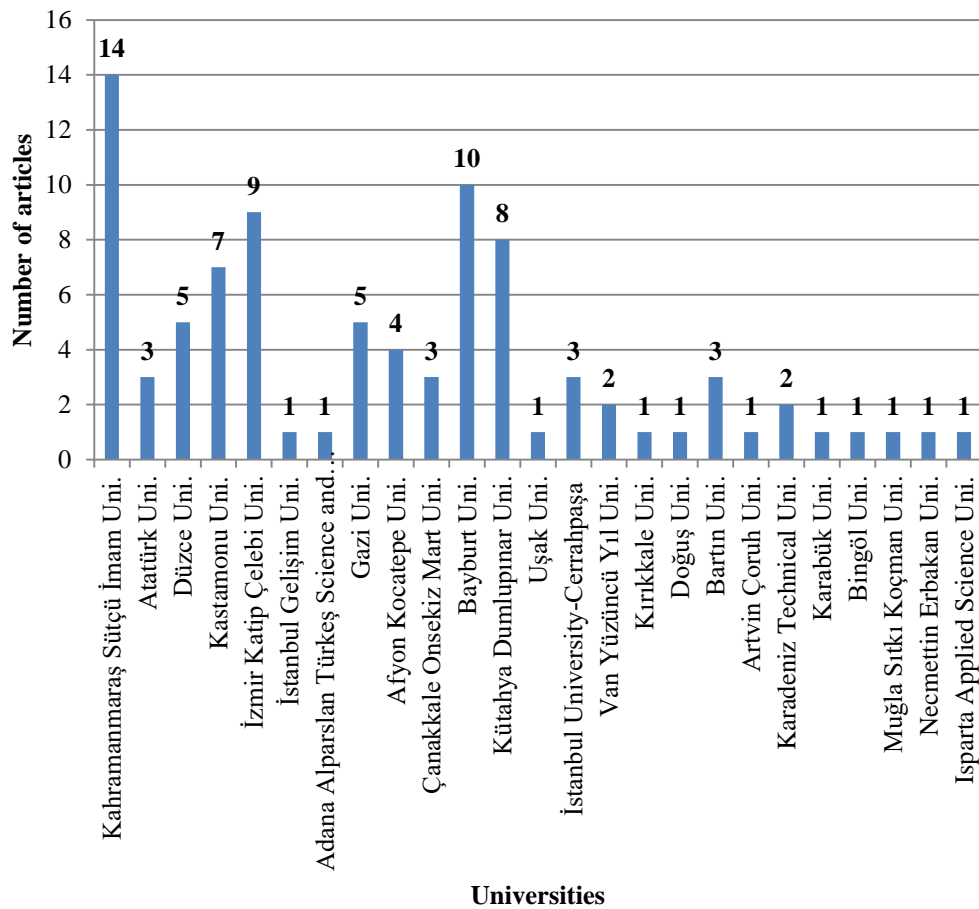*Fig. 3. Distribution of articles regarding the institutions where the authors work*

Fig. 4. Number of articles by universities

A total of 299 keywords were used for 72 articles published in the journal. There is an average of 4 keywords per article. While maximum 6 keywords were used in the articles, at least 3 keywords were used. The most frequently used keyword distribution in the articles was given in Figure 5. Keywords used less than 5 times in the creation of Figure 5 were not included. All keywords used in the articles were shown in the word cloud (Figure 6). This word cloud was created using Word Art software. In the word cloud, words that are used more frequently are shown in larger fonts. When Figure 5 and Figure 6 were examined, the most frequently used keywords in the articles are: "wood or wood material" (12 times), "surface roughness" (11 times), and "heat treatment (8 times), color (8 times), furniture (8 times), mechanical properties (8 times), and shore D hardness" (8 times). While 32 keywords were used 2 times or more, 152 keywords were used only once. In addition, in accordance with the publication policy of the journal, articles must have at least 3 and at most 5 keywords. However, it has been determined that a total of 4 articles published do not comply with the aforementioned publication rules.
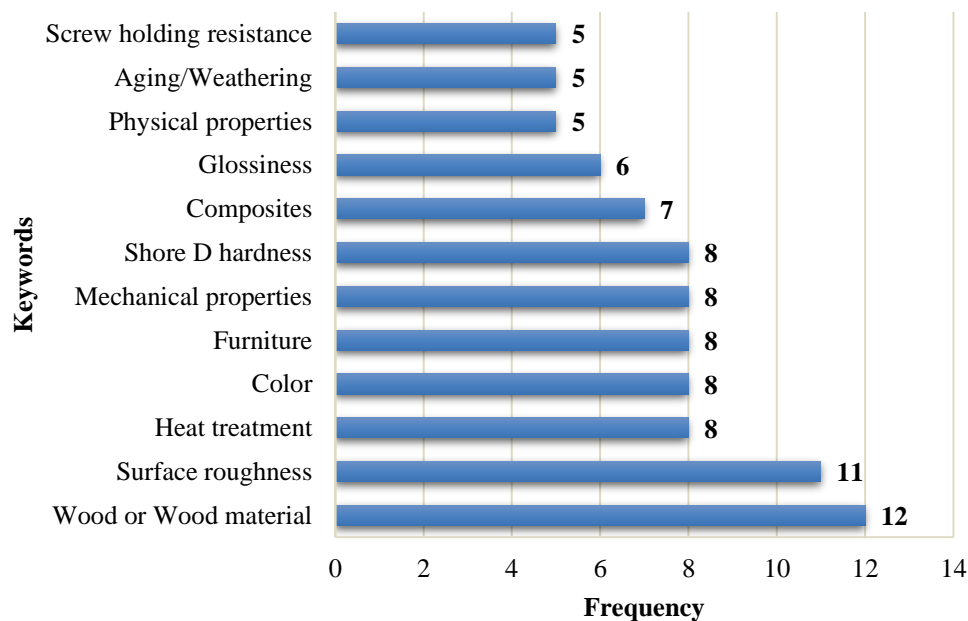

Fig. 5. *The most frequent word/word groups in keywords of studies*

Fig. 6. Graphical representation of the word cloud of keywords

In the study, the publication languages of 72 peer-reviewed articles published in the journal were also examined. Considering the publication languages of the articles in Figure 7, it is seen that the articles were written in Turkish with a rate of 87.5% and in English with a rate of 12.5%. All of the articles published in 2020 and 2021 were written in Turkish. In the first years of the journal's publication (2018 and 2019), the rate of articles in English was 25% and above.

Fig. 7. Distribution of articles by writing language

Figure 8 shows the distribution of the number of pages of the articles published in the journal. According to Figure 8, 57 articles were written between the numbers of 8-12 pages. The shortest article is 5 pages, whereas the longest article is 16 pages.
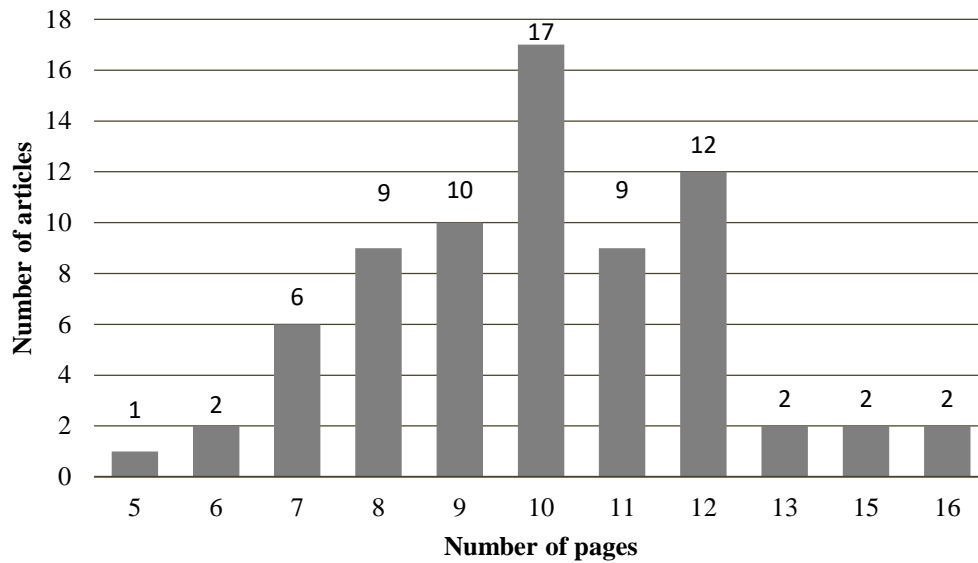
Fig. 8. Distribution of page numbers of articles in the journal

As shown in Figure 9, the number of references used by the authors is between 0-10 at least and 61-70 at most. 26 (37.68%) studies benefited from 11-20 sources. The number of publications that use less than 10 and more than 50 sources is very few. At least 6 references were used, whereas at most 61 references were used.
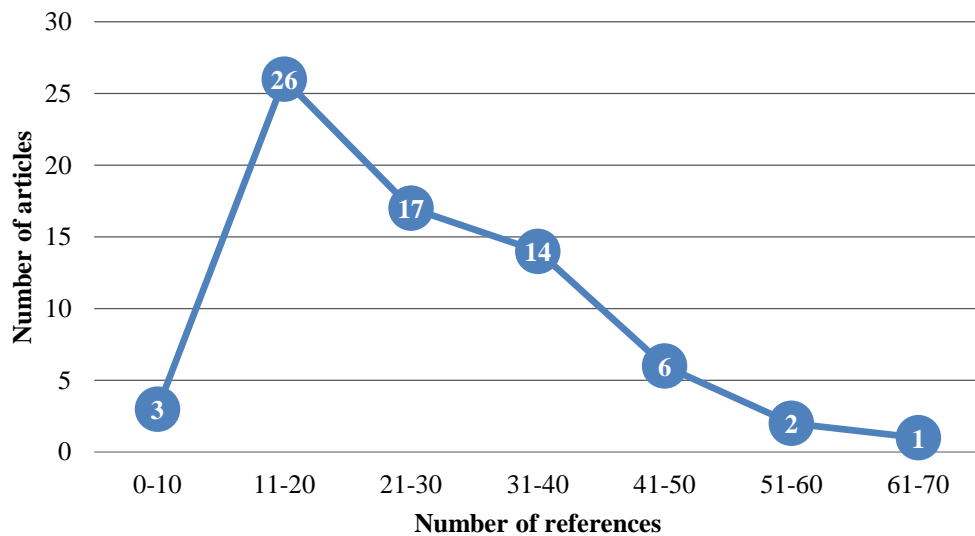

Fig. 9. Distribution of references numbers of articles in the journal

The number of citations to articles in the journal was obtained via Google Scholar. Examining Figure 10 and Table 1, 72 articles published between 2018 and 2023 (citations made until April 30, 2023 are included) received a total of 176 citations. There is an average of 2.43 citations per article. The highest number of citations to the journal was made in 2021. There were 59 citations to articles published this year. 51 of these citations are from articles published in the Furniture and Wooden Material Research Journal. 35 of the citations to the journal were made by the journals that were scanned by Web of Science. 121 citations were made by national and international journals (except SCI-Expanded and ESCI). Whereas 10 of the citations to the journal were made by international book of proceedings, 8 of the citations to the journal were made by national and international theses. No citations were made to 36 articles in the journal. The number of citations made by foreign authors to the journal is quite low.
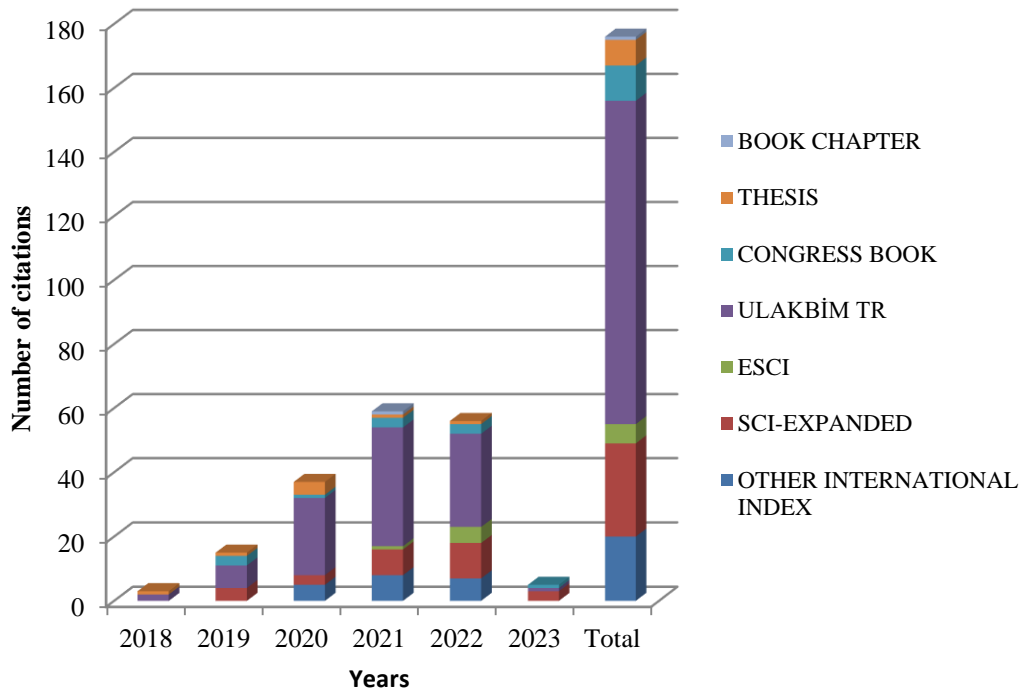
Fig. 10. *Types of studies citing publications in the journal*
Table 1. *Journal citing the furniture and wooden material research journal*

Journals	Index	Number of citations
Furniture and Wooden Material Research Journal	TR Index	51
Turkish Journal of Forestry	TR Index	13
Journal of Bartın Faculty of Forest	TR Index	9
Anatolian Journal of Forest Research	TR Index	1
Journal of the Faculty of Engineering and Architecture of Gazi University	SCI-Expanded	2
Bioresources	SCI-Expanded	16
Kahramanmaras Sütçü Imam University Journal of Engineering Sciences	TR Index	11
International Social Sciences Studies Journal	Other International Index	1
Düzce University Journal of Science and Technology	TR Index	1
Kastamonu University Journal of Forestry Faculty	ESCI	5
Journal of Apitherapy and Nature	Other International index	2
Drewno	SCI-Expanded	1
Eurasian Journal of Forest Science	TR Index	5
BSEU Journal of Science	TR Index	2
Journal of International Social Science Education	Other International Index	1
Journal of Architecture and Life	Other International Index	1
Wood Research	SCI-Expanded	1
International Journal of Lightweight Materials and	Other International	1

Manufacture	Index	
Journal of Global Innovations in Agricultural and Social Sciences	Other International Index	1
CIRP Journal of Manufacturing Science and Technology	SCI-Expanded	1
Wood Material Science & Engineering	SCI-Expanded	3
Measurement	SCI-Expanded	1
Drvna Industrija	SCI-Expanded	1
Axioms	SCI-Expanded	1
Gazi Medical Journal	ESCI	1
Artvin Çoruh University Journal of Forestry Faculty	TR Index	1
Journal of Social and Humanities Sciences Research	Other International Index	1
Journal of Advanced Engineering Studies and Technologies	Other International Index	7
Turkish Journal of Agricultural and Natural Sciences	TR Index	2
Journal of Architecture, Engineering & Fine Arts	Other International Index	1
ISPEC International Journal of Social Sciences & Humanities	Other International Index	1
Bitlis Eren University Journal of Science	TR Index	1
Gümüşhane University Journal of Science and Technology	TR Index	1
UMÜFED International Journal of Western Black Sea Engineering and Science	Other International Index	1
Journal of Business in The Digital Age	Other International Index	1
Journal of Cleaner Production	SCI-Expanded	1
Turkish Journal of Forestry Research	TR Index	3
Turkish Journal of Engineering Research and Education	Other International Index	1
Polymers	SCI-Expanded	1

There are various laws of bibliometric analysis. The compliance of the journal with the Pareto's Law, Price's Law and Lotka's Law was analyzed. The Pareto's Law refers to a method based on analyzing the productivity of writers writing in certain subject areas according to percentage rates. With the Pareto's Law, the writers who produce the most articles (who write 80% of the articles) can be identified and the productivity of writers in certain subject areas can be analyzed [9]. According to Pareto's Law, 80% of the total articles must be written by 20% of the authors [34]. In this context, 80% (58 articles) of 72 articles published in the Furniture and Wooden Material Journal should be written by 20% (15 authors) of 76 authors. As a result of the analysis, it is seen that 20% of the authors (15 authors) wrote 80% (58 articles) of the total articles. Therefore, it can be said that the published articles comply with the Pareto's Law. Price's Law is one of the widely used methods in the literature to measure the productivity of authors. According to Price's Law, the square root of the total number of authors should write half of the total number of articles [35]. According to this rule, 36 articles are expected to be written by 8.72 authors in the Furniture and Wooden Material Research Journal. It was concluded that 9 authors, who have the most studies, wrote 51 articles. According to the findings, it is seen that the results in accordance with the Price's Law have been reached. Lotka's law provides the opportunity for authors who have contributed to a certain literature to determine how many articles they have contributed to. In this way, it practically provides the opportunity to quantitatively estimate how much writing will be written by authors in that literature in the future [36]. According to Lotka's Law, 60% of the authors in a journal should contribute only one article, 15% with two articles and 7%

with three articles [37]. 73.3% of the authors in the Furniture and Wooden Material Research Journal wrote one article, 10.6% wrote two articles, 5.3% wrote three articles and 10.6% wrote more than three articles. It is seen that the Furniture and Wooden Material Research Journal does not comply with the Lotka's Law

IV. CONCLUSION

This research was carried out in order to have information about the studies in the field of "Furniture and Wooden Material" by examining the articles published in the Furniture and Wooden Material Research Journal within a five-year period in terms of various criteria. For this purpose, 72 articles were examined. The vast majority of 72 articles were research papers and the most articles were published in 2021. Scanning the journal in TR index, academic incentives and academic promotion criteria may be effective in the increase in the number of articles in the journal since 2020. 72 articles in the journal were written by 76 authors and all contributors to the journal are Turkish authors. It is a remarkable result that there are no articles by foreign authors in the journal. Although research in the Furniture and Wooden Material Research Journal is predominantly team research, individual studies are available. Continuing this multi-authorship feature can contribute positively to the quality of the studies and therefore to the quality of the journal. 68% of the authors of the articles published in the journal are university researchers, 20% are postgraduate students, and 12% are employees of non-university institutions or organizations. The universities that sent the most articles to the journal are Kahramanmaraş Sütçü İmam University, Bayburt University and İzmir Katip Çelebi University. The rate of articles in English was low (%12.5). Increasing the number of articles in English in the journal may contribute to increasing the national and international recognition of the journal and to the journal receiving more citations in foreign literature. A total of 299 keywords were used in the articles, and the average number of keywords per article is 4. The most frequently used keywords are "wood or wood material" and "surface roughness", respectively. The average number of pages and references per article is 10 and 27, respectively. It is a remarkable result that approximately half of the articles published in the journal do not receive any citations and the number of citations made by foreign researchers is low. Increasing citations to articles is a time-consuming process, and the fact that the journal's publication life covers a short period of six years may be a reason for the low citation rates. Increasing the number of articles written in English can also contribute significantly to increasing citation rates. One of the indicators of the awareness of scientific journals in their field is the citation made to the journal in which the article was published. 51 articles cited the journal in which the article was published. This may be a positive indicator for the journal to be indexed in an international index in the future. However, the self-citation of the journal and the self-citation of the authors can lead to a state of introversion. In addition, it was determined that the studies in the journal were in accordance with the Pareto's Law and the Price's Law and were not in accordance with the Lotka's Law. These Laws, which are used to measure scientific productivity and author productivity, examine the usage data of scientific publications and give the reader an idea about the quality of the relevant scientific work. The study is an original one as it is the first time that a journal publishing on furniture and wood materials has been analyzed in terms of its bibliometric features. This study may contribute to the literature by showing the position of relevant studies in the furniture and wood materials literature.

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