

BIBLIOMETRIC ANALYSIS OF ARTICLES PUBLISHED IN THE FIELD OF AVIATION: DERGIPARK ACADEMIC EXAMPLE

Salim Kurnaz^{1,2}

¹*Asst. Prof., Civil Aviation School, Aircraft Airframe-Engine Maintenance Department, Süleyman Demirel University, Isparta, Turkey, E-mail address: salimkurnaz@sdu.edu.tr*

²*Visiting Asst. Prof., Aviation Management Department, Kazimieras Simonavicius University, Vilnius, Lithuania*

Received 06 09 2022; Accepted 06 09 2022

Abstract

This article examines the progress of academic research on aviation in Turkey. The foundations of aviation were scanned in Dergipark Academic publications. Publications on aviation were reviewed to illustrate what kind of themes were researched by Turkish academics and what were the tendencies of Turkish academics to study regarding aviation. The research, covering a period of 6 years from 2016 to 2021, was carried out by thoroughly examining the publications available in electronic database of Turkish Dergipark Academic. In this research, 170 publication which includes “aviation” in their title were found. The data were analyzed through a bibliometric method by using content analysis. The findings have been evaluated regarding the topics on which academic articles on aviation have been focused up to now and the areas with opportunities for research in future studies.

Keywords: *aviation, bibliometric analysis, dergipark academic.*

JEL Codes: *M10, R10, R41, R42.*

Introduction

The process that started with the manufacture of modern aircraft at the beginning of the twentieth century enabled the first steps of civil aviation to be taken. Later, while the regulatory efforts in the first half of the twentieth century ensured that the civil aviation sector was carried out in an orderly manner, the real change was due to the liberalization trend that affected the whole world, especially America, towards the end of the twentieth century. These liberation efforts have contributed greatly to the development of the aviation industry. Academic studies carried out in parallel with the development of the aviation sector supported this development. Today, there are worldwide academic institutions, academic publishing and scientific research companies working on the aviation sector. However, it is seen that the studies on the aviation industry, especially in developing countries, have not yet deepened.

Air transportation is a sector that is increasing in importance day by day and has become an inseparable part of our lives. It has contributed to the regional, national and international developments in technologic, economic and social life experienced in the twentieth century. It is an important sector especially in terms of creating new job and employment opportunities. For this reason, increasing studies related to the aviation sector will contribute to the healthy growth and sustainability of the aviation sector.

The purpose of this research; is to identify the publications on the aviation sector, registered in the Dergipark academic system and to classify these studies according to some criteria. In this context, academic studies on the aviation sector, among the scientific publications registered in the Dergipark academic system, were examined. In the light of the work carried out, it will be discussed

what kind of studies for the aviation sector were carried out more frequently in the determined period and which areas would be more appropriate to focus on in the future. The limitation of this study is that it covers only a certain period.

Literature Review

In this article, it is aimed to analyze bibliometrically the academic studies carried out in the field of aviation in Turkey, which is a developing country. Examining the studies carried out in Turkey primarily comes from Turkey's rapidly developing and leading position in the field of aviation. Especially after the liberalization at the beginning of the twenty-first century, the aviation industry has become a leader in the economy, providing employment to many employees. Today, the aviation industry employs 245.876 employees directly and contributes 14,26 billions of dollars to the economy (Civil Aviation General Directorate, 2022).

When the university structure, which is the source of academic studies, is examined, it is seen that Turkey has a strong institution structure and academic staff. As of the end of August 2022, there are 208 universities (129 states, 75 foundation universities and 4 foundation vocational schools of higher education) and 84.291 academic staff (32.570 Professor, 20.936 Associate Professor, 41.750 Assistant Professor, 37.948 Lecturer and 50605 Researcher) in Turkey (Turkish Higher Education Council, 2022).

There are lots of studies and research on bibliometric analysis which tried to create a definition to the concept, but it was Pritchard who used the "bibliometrics" term for the first time in 1969. He defined the term as "the application of mathematics and statistical methods to books and other media of communication" (Pritchard, 1969). Bibliometric analysis gained immense popularity in academic research for two reasons. First, using bibliometric analysis makes it easier to process large amounts of scientific data, and second, using bibliometric analysis increases the impact of scientific

research (Donthu et al., 2021: 285; Mergio & Yang, 2016:3).

Bibliometric analysis is basically a quantitative research method. Its main purpose is to reveal the development of a particular discipline in the historical process. Bibliometric analysis also provides direction for researchers by revealing research opportunities and deficiencies in the relevant research discipline. It also aims to reveal collaborative working opportunities for academic institutions. (McBurney & Novak, 2002; Zupic & Cater, 2015; Tanriverdi et al., 2020). Bibliometric analysis also aims to reveal the current structure by revealing the current studies on the research topic, the authors and institutions contributing to the research field. Thanks to these benefits, bibliometric analysis has started to be used in many disciplines such as social sciences and economics (Zupic & Cater, 2015), but studies in the field of aviation and aviation management need to be increased.

Bibliometric studies are classified in three groups as reviews, evaluative, and relational studies (Zupic & Cater, 2015; Johnson & Samakovlis, 2019). Review studies are done by literature reviews or meta-analyses, which are also called as "review methods" (Zupic & Cater, 2015). Evaluative studies use various metrics such as collaboration index, productivity index, impact metrics, and hybrid metrics to measure the academic impact of articles or authors associated with a given research field (Fabregat-Aibar et al. 2019). Finally, relational studies focus on the number of publications in the field. They examine the relationships between units of articles, authors, institutions, journals, references, and keywords within a research field (Echchakoui, 2020).

When examples of general bibliometric analysis are examined, it is seen that the analysis is used very different areas of research such as neuromarketing (Alsharif et al., 2020), human mobility behavior (Benita, 2021), assisted migration (Benomar et al., 2022) and hospitality management (Köseoglu et al. 2015).

Bibliometric analysis is used by Alsharif, Salleh and Baharun on the research trends of neuromarketing in 2020. They used the Scopus database to analysis related articles between 2007 and 2018; and found 137 journal articles on neuromarketing. Bibliometric analysis is also used by Benita (2021) on human mobility behavior in Covid-19. He analyzed the content of published scientific studies indexed on the Web of Science and Scopus during 2020. He identified 70 articles published on transportation and studied these publications. Finally, the bibliometric analysis is used by Benomar et al. (2022) on the evolution of research on assisted migration. They tried to identify the intellectual, social, and conceptual structures of assisted migration research. By doing so they aimed to classify gaps and opportunities for future research on assisted migration. They collected the bibliometric data from Scopus and Web of Science databases.

When the recent bibliometric study examples in the aviation industry are examined, it is seen that they focus on various subjects such as air transportation (Aldemir & Kuyucak Sengur 2017), airport capacity management (Dixit and Jakhar, 2021), air logistics (Ertugut and Altinkurt, 2021), fatigue management (Carvallo et al., 2021) and human factors in aviation (Wan et al. 2020). Aldemir and Kuyucak Sengur (2017) used bibliometric analyze while focusing on the postgraduate thesis on air transportation published between 1972 to 2016 and examined 329 postgraduate thesis (58 doctorate and 271 masters) in Turkey. They found that the thesis, published in that period, focused on business administration, civil aviation management, tourism and economics. Dixit and Jakhar (2021) also used the bibliometric analysis on academic research papers published in Web of Science database on airport capacity management. Their analysis revealed that airport capacity, congestion, competition and ground holding problems are important keywords related to airport capacity management. Another study using bibliometric analysis is the study conducted by

Ertugut and Altinkurt (2021), examining academic studies on air logistics from Web of Science (WOS), Scopus and EBSCO databases. In this study, both the most researched topics in the field of air logistics and the less studied topics and opportunities to study were evaluated.

Finally, when the recent bibliometric analysis studies on the Dergipark academic system, where we also conduct our study, are examined, only two studies identified. First study was examining the relationship between Covid 19 and the tourism sector. In the study conducted by Eker, Durdu and Bozkurt (2022), the effects of Covid 19 on the tourism industry, tourism movements and tourism workers were emphasized. In the second study, conducted by Şimşek and Küçükeşmen (2019), publications on entrepreneurship education have been examined.

The main questions to be answered in this research are:

1. What is the distribution of academic studies published in Dergipark academic in the field of aviation by years?
2. What is the numerical distribution of the authors who conducted these studies?
3. What is the research field distribution of these studies?
4. What are the types of these studies?

Methodology

In this study, bibliometric analysis method was used. The bibliometric analysis method includes evaluative features related to citation analysis in order to determine how many studies have been done on the researched subject in a certain period and how the studies have affected subsequent studies (McBurney & Novak, 2002:108).

By using the bibliometric analysis method, the studies on the aviation sector were examined within the scope of the following features.

- Distribution of the number of articles by years
- Distribution of articles according to the number of authors by years

- Distribution of articles by subject by years
- Distribution of article types by years

The data group of the study is the publications registered and accessible in the “DergiPark Academic” system, which can be downloaded as soon as a search is made with the word group “aviation” on 01.06.2022 in this system. In the “DergiPark Academic” system, 212 publications containing the word group “aviation” were found. In order to determine those publications that are directly related to aviation, a search was made again only for those included in the “title” section. In the search made as a result of this restriction, the number of publications was determined as 173. It was examined whether the publications were related to the subject of “aviation” and it was determined that 3 publications were not related to this subject and were excluded from

the data group. As a result, the number of publications examined structurally was determined as 170.

Results

When the publications in the Dergipark academic system are examined, a total of 170 publications related to the aviation sector were determined within the framework of the search criteria determined in accordance with the research topic. The distribution of identified academic publications by years is given in figure 1. It is seen that 5 studies in 2016, 23 studies in 2017, 23 studies in 2018, 22 studies in 2019, 44 studies in 2020 and 53 studies in 2021 are published in Dergipark academic database. The increase in aviation-related studies over the years shows that studies in this field have increased in parallel with the growth experienced in the aviation industry.

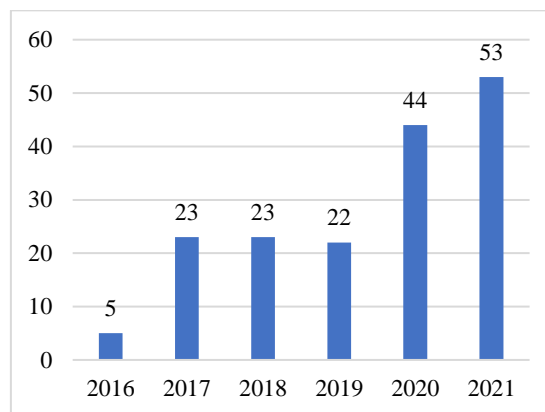


Figure 1. Distribution of the number of articles by years

When the distribution of the studies published in the Dergipark database is examined according to the number of authors (Figure 2); while it was seen that only one study was done by more than one author in 2016, an increase is observed in the number of

studies with multiple authors over the years. It is noteworthy that the number of studies with multiple authors in the last two years, in 2020 and 2021, exceeded the number of studies with a single author.

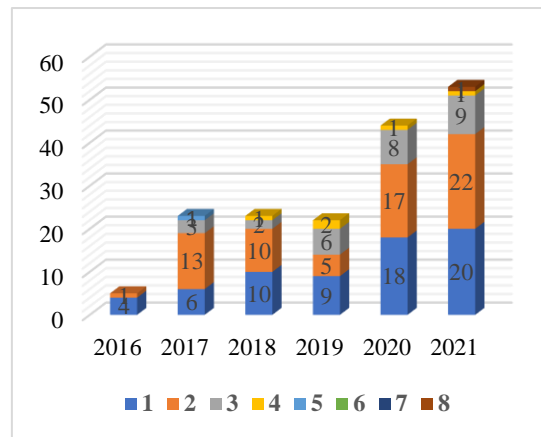


Figure 2. Distribution of articles according to the number of authors by years

When the distribution of articles published in Dergipark database is examined according to their subject (Figure 3); the studies had been mainly published in social sciences and engineering. Only one study is identified in architecture in 2018. The increasing importance of the aviation sector and the great impact of the Covid 19 pandemic on the aviation sector are considered as the reason for the great increase in 2020 and 2021, offering a new research area to researchers.

In this period, it is seen that the studies on the damages caused by the Covid 19 pandemic in the aviation sector, the transportation sector and the tourism sector, crisis management and crisis management strategies have increased. In addition, considering that the effects of the Ukraine-Russia tension, which started in February 2022, on the aviation sector are great, it is expected that the studies in this field will increase even more.

Table 1. Distribution of articles by subject by years

	2016	2017	2018	2019	2020	2021
SOCIAL						
Social Sciences, Interdisciplinary	1	4	1	3	5	8
Business		2	3	3	4	7
Humanities, Joint Disciplines	1	2	2	1	2	4
Education, Scientific Disciplines						2
Law		1	2	2	3	4
Business Finance		2	1	1	3	4
Behavioral sciences		5	3	3	6	7
Education, Educational Research					2	2
History	1	1		2	5	3
Operations, Research and Management Science			1	1	1	2
Psychology			1	1	1	1
Economy		2	2	1		2
ENGINEERING						
Engineering, Air and Space		2	3	2	6	3
Engineering, Machinery	2	1	2	1	3	2
Engineering, Joint Disciplines		1	1		2	1
Industrial Engineering				1	1	1
Architecture, Planning, Design						
Architecture			1			
Total	5	23	23	22	44	53

The distribution of article types by years are given in figure 4. Research articles showed a great increase in last six years. The number of research articles increased from 2 in 2016 to 42 articles in 2021. Even though the number of research articles increased during the last six year it cannot be said to conference papers. The number of conference papers are still very low,

and it should be increased. By the help of digital technologies, online participation in congresses due to Covid 19 made it easier for researchers to participate in congresses. For this reason, the continuation of online congress participation in the upcoming period will contribute to the increase in the number of academic congress papers.

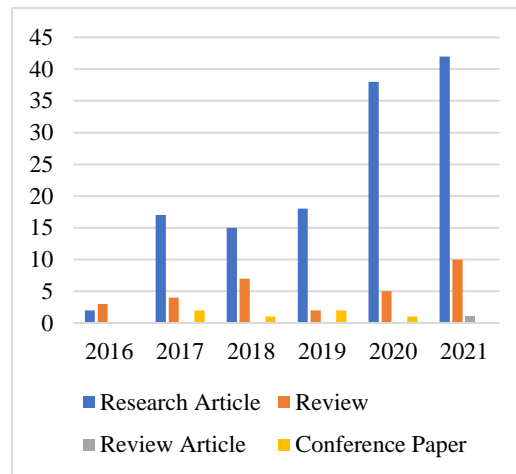


Figure 4. Distribution of article types by years

When the publications made in the Dergipark database are evaluated in general, it is seen that there has been a great improvement in the last six years, and it has doubled in the last two years. It is considered that this increase in the last two years is due to the damage and effects of the Covid 19 pandemic to the aviation industry has created an important field of study for academics. In addition, among the recent studies, it draws attention in the studies on the post-Covid 19 period. For this reason, it is considered that the Russia-Ukraine tension, which emerged in February 2022 and had great negative effects on the aviation sector, such as the pandemic, will create working opportunities for academics working on aviation.

Conclusion

Within the scope of the study, the academic studies registered in the Dergipark academic system and carried out between 2016 and 2021 on the aviation sector were examined using the bibliometric analysis method. It is aimed to shed light on future studies by examining the trends of academic studies on

aviation in last six years. Exploring the social and academic trend of the research field, gaps and possible future research opportunities, which is one of the goals of bibliometric analysis, can facilitate the understanding and implementation of management strategies. The aim of this study was not only giving the numbers of academic research but also acquiring an insight about the trend of research on aviation by Turkish academicians. It is evaluated that the findings obtained will be guiding on which subjects the current studies mainly focus on and the less studied subjects.

When the results were evaluated, it was determined that the academic studies in the field of aviation increased more than twice in the last two years. In addition, it was determined that the number of studies with two or more authors increased more than studies with a single author. These figures mean that academics focus on collaborative studies with multi-authors. Furthermore, it is considered that the recent Covid 19 pandemic and its negative effects on the aviation industry have created a great research opportunity for academics and this opportunity will continue

in the coming period. Finally, due to the negative impact of the Russia-Ukraine tension that emerged in September 2022 on the aviation sector, similar to the pandemic, it is evaluated that it will provide academics with opportunities to work in the fields of crisis management, strategic management and aviation management.

When the distribution of studies carried out in the field of aviation is examined, it is seen that mostly studies are carried out in the field of social sciences and engineering. It can be said that this distribution is parallel to the distribution of academic staff working in universities.

Even though the number of research articles increased during the last six year it cannot be said to conference papers. The number of conference papers are still very low, and it should be increased. By the help of digital technologies, online participation in congresses due to Covid 19 made it easier for researchers to participate in congresses. For this reason, the continuation of online congress participation in the upcoming period will contribute to the increase in the number of academic congress papers.

One of the limitations of this study is that all studies in the field of aviation cannot be included in the scope, as the researchers publish not only on Dergipark Academic but

also on other platforms such as SCOPUS, WoS or SCI. Although articles are published in many languages, especially in English, on other platforms, Dergipark has been chosen because of the publications made in Turkish and journals based in Turkey are gathered in Dergipark database. The other limitation was that the keyword (aviation) might not have been enough to bring forward all academic studies on aviation. Since the titles of the academic studies might not include the keyword, this study might miss some of the studies on aviation. Nonetheless, 170 academic papers in aviation is accepted to be enough to see the common trend of publications on aviation between 2016 and 2021.

It has been tried to reveal which academic studies, carried out in the field of aviation in Turkey, mainly focus on which subjects and in which subjects there are deficiencies or opportunities to work. In addition to its contribution to the literature, this study is expected to shed light on future studies in the field of aviation by academicians. In this context, in future studies it would be useful to examine the academic studies carried out in the field of aviation in other developing countries. And finally, in future studies that will use the bibliometric method; It is considered that the subject can be expanded by examining the studies published in the foreign literature.

References

- Aldemir, H. O., & Kuyucak Sengur, F. (2017). Academic Foundations of Air Transportation Research in an Emerging Country. *International Journal of Aviation Systems, Operations and Training*, 4(1), 15-27. <https://doi.org/10.4018/ijasot.2017010102>.
- Alsharif, A. H., Salleh, N. O. R. Z. M. D., & Baharun, R. (2020). Research Trends of Neuromarketing: A Bibliometric Analysis. *Journal of Theoretical and Applied Information Technology*, 98(15), 2948-2962.
- Benita, F. (2021). Human mobility behavior in COVID-19: A systematic literature review and bibliometric analysis. *Sustainable Cities and Society*, 70, 102916, <https://doi.org/10.1016/j.scs.2021.102916>.
- Benomar, L., Elferjani, R., Hamilton, J., O'Neill, G. A., Echchakoui, S., Bergeron, Y., & Lamara, M. (2022). Bibliometric Analysis of the Structure and Evolution of Research on Assisted Migration. *Current Forestry Reports*, 8(2), 199-213. <https://doi.org/10.1007/s40725-022-00165-y>
- Civil Aviation General Directorate, (2022). Sivil Havacılık Genel Müdürlüğü 2021 Yılı Faaliyet Raporu, <https://web.shgm.gov.tr/documents/sivilhavacilik/files/kurumsal/faaliyet/2021.pdf>,
- Dixit, A., & Jakhar, S. K. (2021). Airport capacity management: A review and bibliometric analysis. *Journal of Air Transport Management*, 91, 102010, <https://doi.org/10.1016/j.jairtraman.2020.102010>.
- Donthu, N., Kumar, S., Mukherjee, D., Pandey, N., & Lim, W. M. (2021). How to conduct a bibliometric analysis: An overview and guidelines. *Journal of Business Research*, 133, 285-296, <https://doi.org/10.1016/j.jbusres.2021.04.070>.

- Echchakoui, S. (2020). Why and how to merge Scopus and Web of Science during bibliometric analysis: the case of sales force literature from 1912 to 2019. *Journal of Marketing Analytics*. <https://doi.org/10.1057/s41270-020-00081-9>.
- Eker, N., Durdu, K. M., & Bozkurt, A. (2022). Covid-19 ve Turizm İlişisini Ele Alan ve Tr Dizin’de Yayınlanan Makalelerinin. *Journal of Tourism and Gastronomy Studies*, 10(1), 335-357.
- Erturgut, R., & Altinkurt, T. (2021). Hava Lojistiği: Bibliyometrik Bir Analiz. *İstanbul Gelişim Üniversitesi Sosyal Bilimler Dergisi*, 8(2), 445-467.
- Fabregat-Aibar, L., Barberà-Mariné, M. G., Terceño, A., & Pié, L. (2019). A Bibliometric and Visualization Analysis of Socially Responsible Funds. *Sustainability*, 11(9), 2526. <https://doi.org/10.3390/su11092526>.
- Gomes de Carvalho, L.M., de Souza Borges, S.F., Machado Cardoso Júnior, M. (2021). Fatigue Assessment Methods Applied to Air Traffic Control – A Bibliometric Analysis. In: Black, N.L., Neumann, W.P., Noy, I. (eds) *Proceedings of the 21st Congress of the International Ergonomics Association (IEA 2021)*. IEA 2021. *Lecture Notes in Networks and Systems*, vol 221. Springer, Cham. https://doi.org/10.1007/978-3-030-74608-7_18.
- Johnson A.G. & Samakovlis, I. (2019). A bibliometric analysis of knowledge development in smart tourism research. *Journal of Hospitality and Tourism Technology*, 10.
- Koseoğlu, M. A., Sehitöğlu, Y., & Craft, J. (2015). Academic foundations of hospitality management research with an emerging country focus: A citation and co-citation analysis. *International Journal of Hospitality Management*, 45, 130–144. <https://doi.org/10.1016/j.ijhm.2014.12.004>.
- McBurney, M.K. & Novak, P.L. (2002). *What is bibliometrics and why should you care?*, IEEE International Professional Communication Conference. 108 - 114. <https://doi.org/10.1109/IPCC.2002.1049094>.
- Merigó, J. M., & Yang, J. B. (2017). A bibliometric analysis of operations research and management science. *Omega*, 73, 37-48, <https://doi.org/10.1016/j.omega.2016.12.004>.
- Pritchard, A. (1969). Statistical bibliography or bibliometrics? *The Journal of Documentation*, 25, 348–349.
- Şimşek, A. & Küçükeşmen, E. (2019). Girişimcilik eğitimi ile ilgili yayınlanan makalelerin bibliyometrik incelenmesi: Dergi Park akademik örneği. *Journal of Social and Humanities Sciences Research*, 6(47), 4400-4417, <http://dx.doi.org/10.26450/jshsr.1684>.
- Tanrıverdi, G., Bakır, M., & Merkert, R. (2020). What can we learn from the JATM literature for the future of aviation post Covid-19? - A bibliometric and visualization analysis. *Journal of air transport management*, 89, 101916, <https://doi.org/10.1016/j.jairtraman.2020.101916>.
- Turkish Higher Education Council, (2022). Yükseköğretim Bilgi Yönetim Sistemi, <https://istatistik.yok.gov.tr>
- Wan, M., Liang, Y., Yan, L., & Zhou, T. (2020). Bibliometric analysis of human factors in aviation accident using MKD. *IET Image Processing*, <https://doi.org/10.1049/ipr2.12167>.
- Zupic, I., & Cater, T. (2015). Bibliometric methods in management and organization. *Organizational Research Methods*, 18(3), 429–472. <https://doi.org/10.1177/1094428114562629>.