

# A Bibliometric Analysis on Museum Exhibitions Research Trends

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## Abstract

Museums compose exhibitions in order to promote their objects and thus to serve to the humanity. Although the museum collections have different qualities and quantities for each museum, organization of the museums, the studies carried out for the exhibition and protection of the collections are similar. In the recent times, the understanding of exhibiting in museums have changed with the modern technologies and concepts. This study is the first bibliometric analysis that ensures statistical and extensive understanding in the museum exhibitions literature, which was carried out on indexes in Web of Science (WoS) Core Collection between 1975 and 2021. The study is expected to urge scholars to implement more studies on museum exhibitions. The analysis grasped 3085 publications drafted by 199 determined and 197 anonymous authors from 75 countries, where art, arts humanities, history, architecture and computer science are the main fields of the research. VOSviewer, which is an analysis application, was used while bibliometric analysing and data visualizing. USA produced 19.32 % of the world's publications on museum exhibitions, which is the first country with the highest number of publications with 596 documents. The most used keywords in this literature are museum, exhibition and museums.

**Keywords:** Museum, Exhibition, Display, Museology, Bibliometrics

## MÜZE SERGİLEMELERİ ARAŞTIRMA EĞİLİMLERİ ÜZERİNE BİBLİYOMETRİK BİR ANALİZ

### Öz

Müzeler, eserlerini tanıtmak ve bu şekilde insanlığa hizmet etmek amacıyla sergiler oluşturmaktadır. Müze koleksiyonları, her müze için farklı nitelik ve niceliklere sahip olmakla birlikte, müzelerde koleksiyonların sergilenmesi ve korunmasına yönelik yapılan çalışmalar benzerlik göstermektedir. Son zamanlarda modern teknolojiler ve kavramlarla birlikte müzelerde sergileme anlayışı da değişmiştir. Bu çalışma, 1975-2021 yılları arasında Web of Science (WoS) Core Collection'daki veri tabanlarında gerçekleştirilen, müze sergilemeleri literatüründe istatistiksel ve kapsamlı bir anlayış sağlayan ilk bibliyometrik analizdir. Çalışmanın, araştırmacıları müze sergilemeleri konusunda daha fazla yayın yapmaya teşvik etmesi beklenmektedir. Analiz, temel araştırma alanları sanat, sanat beşeri bilimler, tarih, mimari ve bilgisayar bilimi olan; 75 ülkeden 199 belirli ve 197 anonim yazar tarafından hazırlanmış 3085 yayını kapsamaktadır. Bibliyometrik analizlerde ve verilerin görselleştirilmesinde, bir analiz uygulaması olan VOSviewer kullanılmıştır. 596 belge ile en fazla yayına sahip ülke olan ABD, müze sergilemeleri konusunda dünya yayınlarının % 19,32'sini üretmiştir. Literatürde en sık kullanılan anahtar kelimeler müze, sergi ve müzelerdir.

**Anahtar Kelimeler:** Müze, Sergileme, Sergi, Müzecilik, Bibliyometri

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## Introduction

Museums are at the society service without aim of profit. Exhibitions of objects belonging to humanity and its environment are preserved, explored and promoted in museums. In addition to the main functions of collection, preservation and exhibition, idea of museum has reached sociological, psychological and technological dimensions (Atasoy, 1999, 16). The museum types are diversified as general museums, archaeological museums, art museums, museums of history, ethnography museums, museums of natural history and geology, museums of science and others. Although the museum collections have different qualities and quantities for each museum, organization of the museums, the studies carried out for the exhibition, storage and protection of the collections are similar. The essential part of the museums where the tactile artefacts or other objects are exhibited and protected are the exhibition areas or units/show cases. The design of these units where the collections are exhibited requires expertise and it is important that these units comply with the criteria of museology and conservation in terms of their design, material and placement in the building.

Objects can be exhibited indoors and outdoors in museums. Small and medium-sized objects exhibited in museum buildings are generally in closed units such as showcases; large-scale objects are also exhibited on the bases by their own. In terms of the designs of the exhibition units used in the museum, the showcases can be used as a stand-alone module, as well as embedded in the wall or suspended from the ceiling. The objects are exhibited in various ways: standing on their own, standing alone on a base or shelf, placed in the showcase, fixed to the wall or floor, and suspending from the ceiling.

Not only the artefacts are exhibited in the museums; the exhibition itself has become a work of art (Çalışkan, 2016, 26). Museum exhibition units should be designed in order to meet the criteria such as concept, material, size, shape, technology, lighting and positioning. Besides chronological or regional exhibition order, concepts such as storytelling and imagination are also applied for the fine art, archaeological objects or others (Bedford, 2014). Exhibition designs are the communication means of the museums, makes the visitor think on the different sides of the exhibition and the content (Çalışkan, 2016, 33). The comprehensibility of the permanent exhibitions, in other words, the object-society relation should be questioned in museums (Atagök, 2010, 10). There are multidimensional scaling and clustering techniques investigating the different ways that they are perceived by the museum visitors (Alt and Shaw, 1984).

In accordance with contemporary museology and conservation criteria, showcase qualities such as the materials and the construction of the show-

case have changed over time. As a security measure, sensors and alarm systems have been applied to the showcases. Lightings were placed inside the showcase, and the type of lighting elements were changed in terms of the energy and heat they spread around. Devices like thermometer, hygrometer, dehumidifier etc. have been added in order to obtain essential microclimate environment inside the showcase and cabinets.

Besides, hands-on exhibitions, interactive displays or virtual reality and augmented reality exhibitions are in increasing trends in museums as a way of learning and developing the visitor experience of the exhibitions. These types of display enable various audience profiles (disabled people, students of all ages etc.) to engage and get information (Walczak, Cellary, White, 2006). Use of technology in the interactive applications in museums depend on the museum types, target groups and the purpose of the exhibitions (Boyras, 2013, 2).

Being the base of this study, bibliometrics ensures statistical and integrated information of scientific literature in a topical working area. The aim of these studies is to produce consequential information from data stacks. There is a popularity in the bibliometric techniques in various disciplines. Bibliometric analysis has been commonly studied in the recent times, on the other hand no bibliometric study has been published about the studies on museum exhibitions. The literature on museum studies contains only one bibliometric analysis written on the general issues of the literature between 1995 and 2014 (Kuo & Yang, 2015). There are few bibliometric studies on the sub-branches of the museology. A bibliometric analysis on museum education was written by Bozdoğan (2020). What is more, a bibliometric study about museum architecture was studied by Doğruer (2022). In order to completely utilize from the studies on museum exhibitions, data analysis is essential in the academic literature. This study, which is the first bibliometric study on museum exhibitions aims to offer data of a comprehensive bibliometric analysis of the topic.

Materials and methods are going to be stated in the following section. The results section constitutes from the analysis on the general feature of the literature, outputs according to countries, authors, journals and organizations, and analyses of citations, keywords and bibliometric network. Finally, conclusion section take part with brief overview and future implications of the study.

## **Material and Method**

This study covers the bibliometric analysis of the articles on museum exhibitions which are indexed in Web of Science Core Collection, within a period between 1975 and 2021. In the examining process, a total of 3085 publications are attained in the database. The analysis includes 3085 publications

written by 199 determined and 197 anonymous authors from 75 countries, where art, arts humanities, history, architecture and computer science are the main research fields.

The data of this article have been gathered from SCI-Expanded, SSCI, A&H-CI, emerging sources citation index (ESCI), conference proceedings (CPCI-S, CPCI-SSH) and book citation index (BKCI-S, BKCI-SSH) in the database of Web of Science Core Collection (WoS), which is a reliable and holistic database service using multiple databases on the different academic disciplines. Exhibit\* or display\* or showcase\* or 'show case\*' and museum\* or museology were used as the pivotal keywords to title search the WoS Database. The star symbol (\*) characterized the letters like -ing or -s. The keyword 'art exhibit\*' or 'art gallery' or 'art galleries' were excluded. All of the documents published on *museum exhibitions* between 1975 and 2021 were analyzed in the study. As an article on *museum exhibitions* was firstly published in the index in 1975, it is chosen as the starting year of the analyzing.

Highly contributed authors, organizations and countries were identified from the database. The study involves the techniques such as author wise and keyword wise distributions related to this topic using a bibliometric analysis tool called VOSviewer, which is a freeware analysis application used for bibliometric analysing, data visualizing and creating bibliometric networks (VOSviewer, 2022). For the country classification of the studies on museum exhibitions, United Nations (UN) system was applied (UN, 2022). In addition, a global productivity map was produced on Excel.

### **General Feature of the Literature**

The research in the database of Web of Science Core Collection is composed of 3085 articles in the literature of museum exhibitions between 1975 and 2021. 253 of the all documents were open access. The number of publications shows that the peak year was 2017 with 168 articles (Fig. 1). English is the main language used in the museum exhibitions literature with 2349 articles followed by German, French, Spanish and Italian (n=295, 213, 68 and 36, respectively; Table. 1).

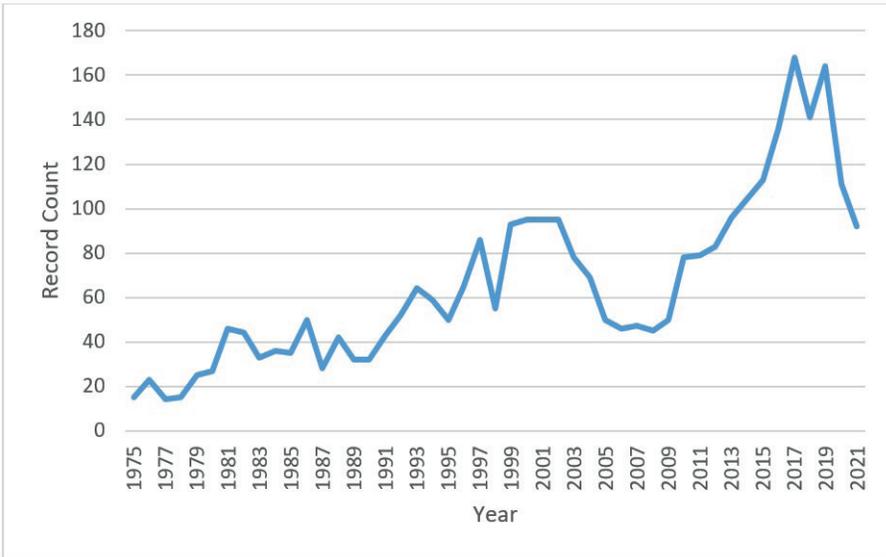


Figure.1 Number of the publications on museum exhibitions by year.<sup>1</sup>

Language	Record Count	% of the 3085 Articles
English	2349	76.14
German	295	9.56
French	213	6.90
Spanish	68	2.20
Italian	36	1.17
Russian	29	0.94
Czech	19	0.62
Croatian	18	0.58
Portuguese	15	0.49
Swedish	9	0.29

Table.1 Languages used on museum exhibitions between 1975 and 2021.

The most studied research areas are art, humanities multidisciplinary, history, architecture and archaeology (24.24, 11.57, 11.28, 6.80 and 3.95 %, respectively; Table.2). Of the *museum exhibitions* documents published between 1975 and 2021 in the WoS database, the most common document types were articles, book reviews, proceedings papers, editorial materials and notes (n=1577, 477, 260, 224 and 211; respectively) (Fig.2).

In 2021, the most common document types were articles, editorial materials, proceedings papers and book reviews (n=70, 5, 4 and 3; respectively) on mostly art humanities, engineering, art, computer science and educational research (n=16, 13, 10, 9 and 6; respectively).

<sup>1</sup> All of the figures and tables are prepared by the author.

Research Area	Record Count	% of the 3085 Articles
Art	902	29.24
Humanities Multidisciplinary	357	11.57
History	348	11.28
Architecture	210	6.80
Archaeology	122	3.95
Asian Studies	119	3.86
Education Educational Research	104	3.37
Anthropology	92	2.98
History Philosophy of Science	91	2.95
Folklore	87	2.82
Cultural Studies	76	2.46
Information Science Library Science	71	2.30
Computer Science Theory Methods	61	1.98
Computer Science Interdisciplinary Applications	53	1.72
Computer Science Artificial Intelligence	52	1.69
Religion	52	1.69
Computer Science Information Systems	50	1.62
Engineering Electrical Electronic	50	1.62
Social Sciences Interdisciplinary	42	1.36
Literature	40	1.30

Table.2 The most 20 studied research areas in the museum exhibitions literature between 1975 and 2021

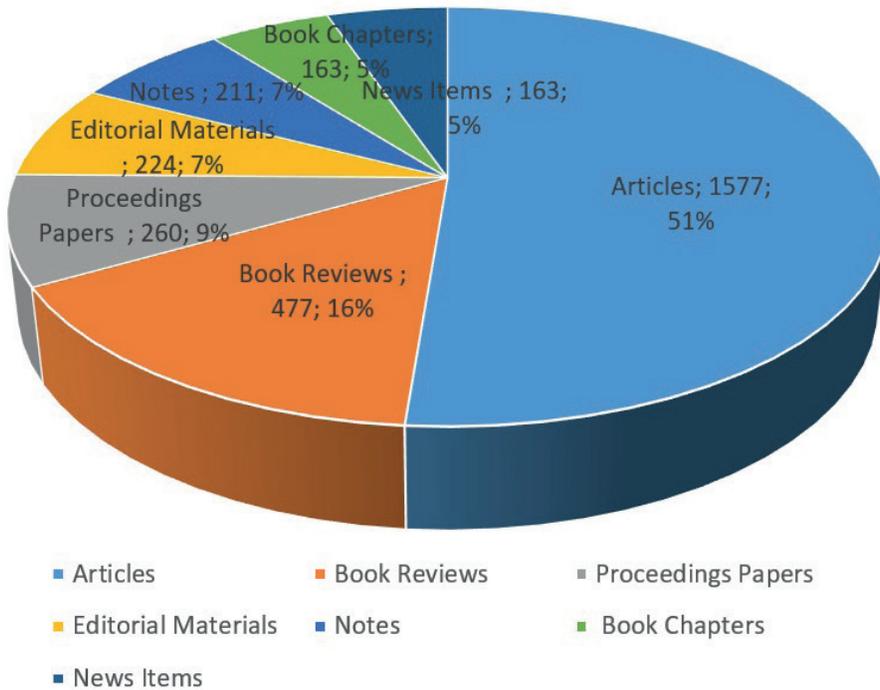


Figure.2 Distribution of document types on museum exhibitions published between 1975 and 2021.

## Outputs According to Countries, Authors, Journals and Organizations

Regarding the publication numbers, USA produced 19.32 % of the world's publications on 'museum exhibitions', which is the first country with the highest number of publications with 596 documents (Table.3) and followed by England, Germany and Italy (n=309, 150 and 88, respectively; Fig.3). China, which is among the developing countries according to the UN classification, is the fifth country of all with 83 documents (2.69 %) and first of the developing countries followed by Taiwan, South Korea, Brazil, South Africa, Turkey (n=24, 23, 20, 13 and 12, respectively). Russia among the economies in transition take place in the most productive 20 countries list with 39 documents. The countries that contribute to the literature the most are in the continents of America and Europe (Fig.4).

In 2021, USA produced 20 documents of the world's publications (Total=93) on 'museum exhibitions', which is the first country with the highest number of publications and followed by China, Italy, France and Russia (n= 13, 6, 5 and 5; respectively).

Country/Region	Record Count	% of the 3085 Articles
USA	596	19.32
England	209	6.77
Germany	150	4.86
Italy	88	2.85
China	83	2.69
Canada	59	1.91
Australia	58	1.88
Japan	56	1.82
Spain	48	1.56
France	47	1.52

Table.3 Top ten countries on museum exhibitions between 1975 and 2021.

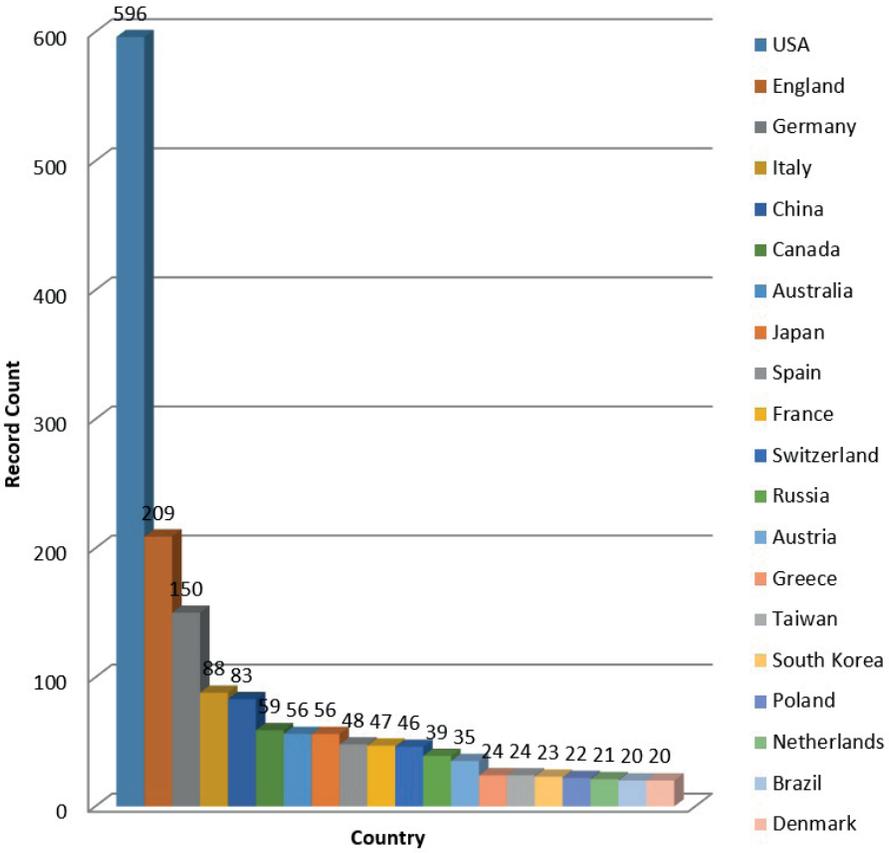


Figure.3 Top 20 countries on museum exhibitions between 1975 and 2021.

Publication Density of the World Countries

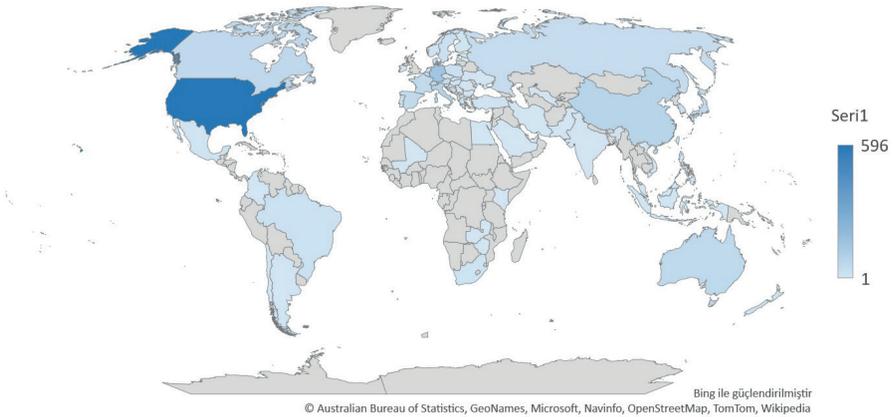


Figure.4 Publication density of the world countries in the field of museum exhibitions between 1975 and 2021

197 of the mentioned publications are written by anonymous authors. Morsch C is the most prolific author of the museum exhibitions literature between 1975 and 2021 with 25 documents (6.39 %) followed by Sachs A, Sieber T, Feldmann H and Sobanova P (n=25, 25, 25, 13 and 11, respectively; Table.4). Morsch C, Sachs A and Sieber T are concurrently the most prolific editors of the selected period with 26 articles each (0.84 %, Table.5). IEEE, ACM and IOP Publishing are the group of authors who have studied the museum exhibitions between 1975 and 2021 (n=25, 17 and 8, respectively; Table.6).

The publications with the most contributions to the literature of *museum exhibitions* were *Museum News*, *Connaissance Des Arts*, *Arts of Asia Artnews* and *Urbanism* and *Art in America* (n=95, 79, 67, 51 and 44, respectively; Table.7). *Museum News* is one of the earliest publications, which also published the most documents in the *museum exhibitions* literature as well. On the other hand, no article has been published on museum exhibitions in this publication between 2008 and 2021. Similarly, one of the publications with most contributions, *Connaissance des Arts* has no article on *museum exhibitions* in the periods of 2005-2013 and 2015-2021. The results show that the 10 most productive publications have limited number of documents on *museum exhibitions* in the recent years. *Curator The Museum Journal*, which has the most contributions in the literature in 2021, has published on the literature since 2012. The most contributive book series to the *museum exhibitions* literature between 1975 and 2021 were *Edition Museum*, *Lecture Notes in Computer Science*, *Routledge Research in Museum Studies*, *IOP Conference Series Materials Science and Engineering* and *Studies in the History and Society of the Maghrib* (n=34, 17, 17, 7 and 7, respectively; Table.8).

Author	Record Count	% of the 3085 Articles
Anonymous	197	6.39
Morsch C	25	0.81
Sachs A	25	0.81
Sieber T	25	0.81
Feldmann H	13	0.42
Sobanova P	11	0.36
Jodido P	10	0.32
Blanc D	8	0.26
Hoger M	8	0.26
Kramer M	7	0.23
Rey V	7	0.23
Lau A	6	0.19
Nguyet T	6	0.19
Odonell SC	6	0.19
Cortazzi H	5	0.16
Dziekani V	5	0.16
Heartney E	5	0.16
Inagaki S	5	0.16
Kusunoki F	5	0.16
Park E	5	0.16

Table.4 The 20 most prolific authors of the museum exhibitions literature between 1975 and 2021.

<b>Editor</b>	<b>Record Count</b>	<b>% of the 3085 Articles</b>
Morsch C	26	0.84
Sachs A	26	0.84
Sieber T	26	0.84
Muchitsch W	5	0.16
Remondino F	5	0.16
Thwaites H	5	0.16
Benefield A	4	0.13
Bitgood S	4	0.13
Buggeln G	4	0.13
Cannata N	4	0.13
Gahtan MW	4	0.13
Paine C	4	0.13
Plate SB	4	0.13
Shettel H	4	0.13
Sonmez MJM	4	0.13
Thompson D	4	0.13
Williams R	4	0.13
Zhang H	4	0.13
Zhang Y	4	0.13
Abbas MY	3	0.10

Table.5 The 20 most prolific editors of the museum exhibitions literature between 1975 and 2021.

<b>Group Author</b>	<b>Record Count</b>	<b>% of the 3085 Articles</b>
IEEE	25	0.81
ACM	17	0.55
IOP	8	0.26
ASSOC Comp Machinery	7	0.23
MuseumsVerband Landes Brandenburg	6	0.19
IEEE Computer Society	5	0.16
CIE	3	0.10
Soc Tech Commun	2	0.06
AMG	1	0.03
ASME	1	0.03

Table.6 The 10 most prolific group authors in the museum exhibitions literature between 1975 and 2021.

<b>Sources</b>	<b>Record Count</b>	<b>% of the 3085 Articles</b>
Museum News	95	3.08
Connaissance Des Arts	79	2.56
Arts of Asia	67	2.17
Artnews	51	1.65
Art in America	44	1.43
Smithsonian	43	1.39
Edition Museum	34	1.10
Oriental Art	33	1.07
Osterreichische Zeitschrift Fur Volkskunde	33	1.07
Museum	31	1.00
Museum International	30	0.97
Zeitschrift Fur Volkskunde	29	0.94
Ausstellen und Vermitteln im Museum der Gegenwart	26	0.84
Exhibiting and Mediating in the Museum of the Present	26	0.84
History Today	26	0.84
Architectural Record	23	0.75
Magazine Antiques	23	0.75
Public Historian	23	0.75
Museum Management and Curatorship	22	0.71
Oeil Magazine International Art	22	0.71

Table.7 The publications with the most contributions to the museum exhibitions between 1975 and 2021.

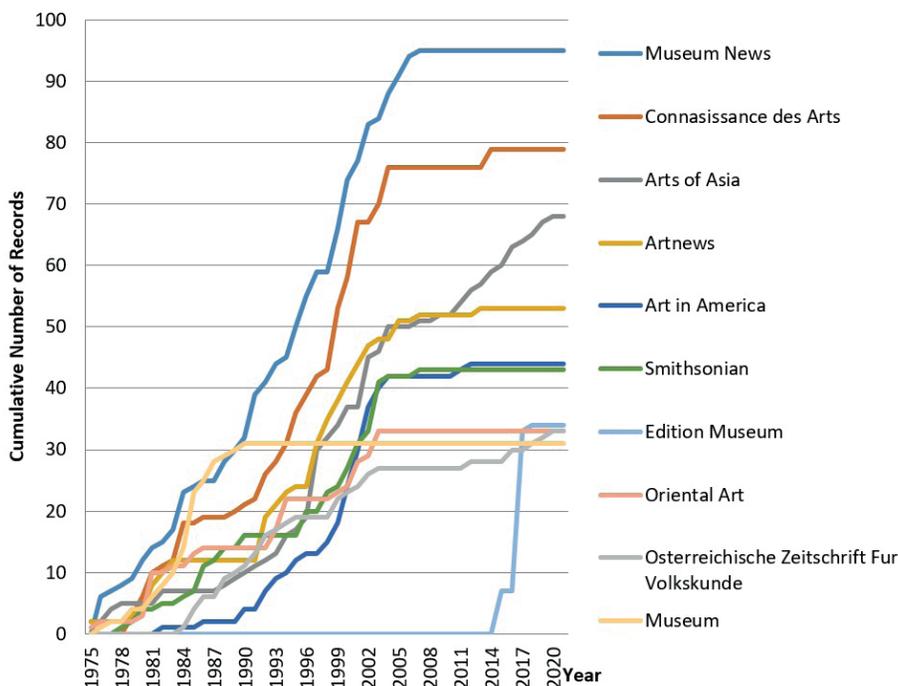


Figure.5 The cumulative number of records for the sources with the most contributions to the museum exhibitions literature between 1975 and 2021.

Book Series	Record Count	% of the 3085 Articles
Edition Museum	34	1.10
Lecture Notes in Computer Science	17	0.55
Routledge Research in Museum Studies	17	0.55
IOP Conference Series Materials Science and Engineering	7	0.23
Studies in the History and Society of the Maghrib	7	0.23
Advances in Social Science Education and Humanities Research	6	0.19
Communications in Computer and Information Science	6	0.19
Edition Museumsakademie Joanneum	5	0.16
Procedia Social and Behavioral Sciences	4	0.13
Visitor Studies Theory Research and Practice	4	0.13
ACM IEEE Joint Conference on Digital Libraries JCDL	3	0.10
Advanced Materials Research	3	0.10
Architecture Architekturen	3	0.10
Heritage Studies in the Muslim World	3	0.10

Table.8 The book series with the most contributions to the museum exhibitions between 1975 and 2021.

The conferences in the field of *museum exhibitions* were “Conference on Denazified Zone on Dealing with the Era of National Socialism in East German City and Regional Museums”, “1993 Visitor Studies Conference”, “Conference on Florence Heri Tech the Future of Heritage Science and Technologies”, “4th International Mega Conference on Future Generation Information Technology Fgit 2012” and “Conference on From Malacca To Manchester Cura-

ting Islamic Collections Worldwide” (n=6, 4, 4, 3, 3, 3, respectively; Table.9). University of California System (USA) is the most productive organization of the museum exhibitions literature between 1975 and 2021 with 38 documents, followed by University of London (England), Smithsonian Institute (USA), Carl von Ossietzky Universitat Oldenburg (Germany) and HGK Basel (Switzerland) were the most productive organizations (n=33, 27, 26 and 25, respectively; Table.10).

Meeting title	Record Count	% of the 3085 Articles
Conference on Denazified Zone on Dealing with the Era of National Socialism in East German City and Regional Museums	6	0.19
1993 Visitor Studies Conference	4	0.13
Conference on Florence Heri Tech the Future of Heritage Science and Technologies	4	0.13
4th International Mega Conference on Future Generation Information Technology Fgit 2012	3	0.10
Conference on From Malacca To Manchester Curating Islamic Collections Worldwide	3	0.10
Digital Heritage International Congress	3	0.10
10th International Conference on Tangible Embedded and Embodied Interaction Tei	2	0.06
29th Symposium of The Scientific Instrument Commission Sic of The International Union for History and Philosophy of Science Iuhps	2	0.06
2nd Amer Annual International Conference on Quality of Life Aicqol	2	0.06
2nd International Joint Conference on Ambient Intelligence	2	0.06

Table.9 The conferences in which the number of the presented documents on museum exhibitions was the most, between 1975 and 2021.

Organization-Enhanced	Country	Record Count	% of the 3085 Articles
University of California System	USA	38	1.23
University of London	England	33	1.07
Smithsonian Institute	USA	27	0.88
Carl von Ossietzky Universitat Oldenburg	Germany	26	0.84
HGK Basel	Switzerland	25	0.81
Hist Museum Basel	Switzerland	25	0.81
Landesmuseum Zurich	Switzerland	25	0.81
Museum Gestaltung Zurich	Switzerland	25	0.81
Zurcher HSCH Kunste	Switzerland	25	0.81
Natural History Museum London	England	23	0.75

Table.10 The 10 most productive enhanced organizations of the museum exhibitions literature between 1975 and 2021.

## Analyses of Citations, Keywords and Bibliometric Network

The h-index that is defined as the calculated metric value to measure productivity and citation impact in the museum exhibitions literature is found as 31. The total number citations are 4791 (4427 without self-citations) and the average number of citations is 1.55 per item, as of the date of March 2022.

The most cited document was an original article published in 2004 and entitled “Designs for learning: Studying science museum exhibits that do more

than entertain” by Allen, S (Table.11). It was cited 156 times. The study is about supporting the design process of an exhibition with a solid program of research and evaluation. A Science Museum was studied in regards to the museum exhibits. The article aimed to focus on the areas of “immediate apprehendability, physical interactivity, conceptual coherence, and diversity of learners” in the case study (Allen, 2004).

Among the publications of 2021, the most cited article was “The Invisible Museum: A User-Centric Platform for Creating Virtual 3D Exhibitions with VR Support” regarding the ways of making the exhibits accessible and explorable via the websites of the museums and exposed databases (Zidianakis and others, 2021).

Article	Author(s)	Year	Total Citation	Average per year
Designs for learning: Studying science museum exhibits that do more than entertain	Allen, S	2004	156	8.21
Exhibiting interaction: Conduct and collaboration in museums and galleries	vom Lehn, D; Heath, C and Hindmarsh, J	2001	146	6.64
The politics of the exhibition: Viewing corporate museums through the paradigmatic lens of organizational memory	Nissley, N and Casey, A	2002	97	4.62
A methodology for microclimatic quality evaluation in museums: Application to a temporary exhibit	Corgnati, SP; Fabi, V and Filippi, M	2009	90	6.43
Pictures at an exhibition: Conflicting pressures in museums and the display of art	Alexander, VD	1996	81	3
Facilitating Family Group Inquiry at Science Museum Exhibits	Gutwill, JP and Allen, S	2010	71	5.46
Technological novelty and open-endedness: Two characteristics of interactive exhibits that contribute to the holding of visitor attention in a science museum	Sandifer, C	2003	66	3.3
Experiencing Exhibitions: A Review of Studies on Visitor Experiences in Museums	Kirchberg, V and Trondle, M	2012	63	5.73
Matrix-assisted laser desorption/ionization Fourier transform mass spectrometric analysis of oxygenated triglycerides and phosphatidylcholines in egg tempera paint dosimeters used for environmental monitoring of museum display conditions	van den Brink, OF; Boon, JJ; (...); Heeren, RMA	2001	49	2.23
Assessment of thermo-hygroscopic quality in museums: Method and in-field application to the "Duccio di Buoninsegna" exhibition at Santa Maria della Scala (Siena, Italy)	Corgnati, SP and Filippi, M	2010	48	3.69

Table.11 The most cited articles published in the museum exhibitions literature between 1975 and 2021.<sup>2</sup>

The most used keywords on *museum exhibitions* are museum, exhibition and museums (Table.12; Fig.6). When analyzing the co-authorship among authors, the most collaborative ones are identified as Moersch, Carmen, Sachs and Angeli (Fig.7).

2 The data is gathered from WoS in the end of March 2022.



## Conclusion

Bibliometrics is a way of analysis that is used for providing quantitative and qualitative analysis of a definite subject in the academic field (Van Eck and Waltman, 2010). It is method of summarizing the studies in the literature by assessing the certain indicators (Thelwall, 2008). Document analysis is a method of analyzing extensively the drafted documents about a particular topic without interviews or observations (Yıldırım and Şimşek, 2018). The analysis of the information in the matters of author, subject, countries, research areas, keywords, and also cited author and cited sources of the scientific study exposing the general structure of the field on the side of the statistical data (Zan, 2012). The bibliometric studies show the characterization of the development (Deng, Tian and Zhang, 2009).

The discipline of bibliometrics has advanced and increased in number in the last decades. There is a total of 17082 bibliometric studies published in the time period of this study (in March 2022) according to the WoS databases, when 'bibliometric analysis', 'bibliometric analyses', bibliometrics or 'bibliometric study' were used as search keywords. In the recent years, museum science and a few of sub-branches of museology were studied by bibliometrics. There is only one bibliometric analysis written museum science literature between 1995 and 2014 (Kuo & Yang, 2015). Also, a bibliometric analysis was accomplished on museum education by Bozdoğan (2020); and a retrospective study was prepared by Doğruer (2022) about museum architecture. Nevertheless, literature on museum exhibitions does not contain any bibliometric analysis.

In conclusion, the research outputs of the scientists, journals, organizations and countries from the publications on *museum exhibitions* are conducted by retrieving data from WoS database via bibliometrics in the study. Data mining research showed that there has been a tenfold increase in annual paper production on *museum exhibitions* on the WoS from the starting date to 2019. Despite this trend of growth in the numbers, there was a decrease in the number of publications between the years of 2005-2009 and 2020-2021.

It is shown in the study that 90% of the top ten countries by total number of publications on *museum exhibitions* between 1975 and 2021 are from the countries in developed category. The countries that contribute to the literature the most are in the continents of America and Europe. China, which is among the developing countries according to the UN classification, is the fifth country of all with 83 documents and first of the developing countries followed by Taiwan, South Korea, Brazil, South Africa and Turkey. Russia among the economies in transition take place in the most productive 20 countries list with 39 documents.

The topic of *museum exhibitions* should be supported in the underdeveloped and developing countries besides developed countries in the academic studies. This study is the first bibliometric analysis in the academic literature of *museum exhibitions*; and it may urge scholars to implement more studies on this definite topic and stimulate growth on the literature.

### **Conflict of Interest**

There is no conflict of interest.

## REFERENCES

- Alt, M. B. and Shaw, K. M. (1984). "Characteristics of Ideal Museum Exhibits", *British Journal of Psychology*, 75 (Feb), pp. 25-36.
- Artsın, M. (2020). "Bir Metin Madenciliği Uygulaması: Vosviewer" (A Text Mining Application: Vosviewer), *Eskişehir Teknik Üniversitesi Bilim ve Teknoloji Dergisi B-Teorik Bilimler*, 8 (2), pp. 344-354.
- Atagök, T. (2010). "Müzecilik ve Türk Müzeciliği". *Ege Mimarlık* (74). pp. 8-13.
- Atasoy, S. (1999). *Müzecilikten Yansımalar*. İstanbul: Anka Yayınları.
- Bedford, L. (2014). *Art of Museum Exhibitions: How Story and Imagination Create Aesthetic Experiences*. England: Routledge.
- Bozdoğan, K. (2020). "A Bibliometric Analysis of Educational Studies About Museum Education", *Participatory Educational Research*, 7 (3), pp. 161-179. <http://dx.doi.org/10.17275/per.20.40.7.3>.
- Boyraz, B. (2013). "Müze Teknolojileri ve Sergileme Farklılıkları", *Uluslararası Hakemli Sosyal Bilimler E-Dergisi* (39), pp. 1-14.
- Çalışkan, C. (2016). "Sergileme Tasarımının Gelişimi ve Müze ile Sanat Galerilerinin Karşılaştırılması". *Yıldız Journal of Art and Design* 3 (1). pp. 26-42.
- Deng, S., Tian, Y., and Zhang, H. (2009). "Using The Bibliometric Analysis to Evaluate Global Scientific Production of Data Mining Papers", 2009 First International Workshop on Database Technology and Applications, IEEE Computer Society, pp. 233-238.
- Doğruer, F.S. (2022). "A Retrospective Study: Bibliometric Analysis of the Museum Architecture Literature Between 1980 and 2020", *Library, Archive and Museum Research Journal*, 3 (1), pp. 27-43 <https://doi.org/10.29228/lamre.54973>.
- Kuo, C.W. & Yang, Y.H. (2015). "The Bibliometric Analysis of Literature on Museum Studies", *ISPRS Annals of the Photogrammetry, Remote Sensing and Spatial Information Sciences*, Vol: II-5/W3, '5th International CIPA Symposium 2015, 31 August-04 September 2015, Taipei, Taiwan.
- Thelwall, M. (2008). "Bibliometrics to Webometrics", *Journal of Information Science*, 34(4), pp. 605-621.
- Van Eck, N.J. and Waltman, L. (2010). "Software Survey: Vosviewer, A Computer Program For Bibliometric Mapping", *Scientometrics*, 84 (2), pp. 523-538.
- Walczak, K., Cellary, W. and White, M. (2006). "Virtual Museum Exhibitions", *Computer*, 39 (3), pp. 93-95.

Yıldırım, A. and Şimşek H. (2018). Sosyal Bilimlerde Nitel Araştırma Yöntemleri (Qualitative Research Methods in the Social Sciences). (11th ed.). Ankara: Seçkin Publishing.

Zan, B.U. (2012). Türkiye’de Bilim Dallarında Karşılaştırmalı Bibliyometrik Analiz Çalışması (A Comparative Bibliometric Analysis Study in Scientific Disciplines at Turkey) (Published Doctorate Dissertation). Ankara: Ankara University Social Sciences Institute.

Zidianakis, E.; Partarakis, N.; Ntoa, S.; Dimopoulos, A.; Kopidaki, S.; Ntagianta, A.; Ntafotis, E.; Xhako, A.; Pervolarakis, Z.; Kontaki, E.; Zidianaki, I.; Michelakis, A.; Foukarakis, M.; Stephanidis, C. (2021). “The Invisible Museum: A User-Centric Platform for Creating Virtual 3D Exhibitions with VR Support”. Electronics 2021, 10 (3), p. 363. <https://doi.org/10.3390/electronics10030363>.

## INTERNET REFERENCES

United Nations. (2022). “World Economic Situation and Prospects 2022”.

Accessed on March 29, 2022

[https://www.un.org/development/desa/dpad/wp-content/uploads/sites/45/WESP2022\\_ANNEX.pdf](https://www.un.org/development/desa/dpad/wp-content/uploads/sites/45/WESP2022_ANNEX.pdf)

Vosviewer. (2022). “Visualizing Scientific Landscapes”.

Accessed in April, 2022

<http://www.vosviewer.com/>