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A Bibliometric Analysis of Educational Studies About "Museum Education"

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This study aimed at analyzing the scientific publications about museum education with regard to bibliometric indicators. The study was carried out as a case study, one of the qualitative research methods. The bibliometric data were taken from the WoS database produced by Clarivate Analytics. An online scanning was performed in WoS database. The scan interval involved the dates between 1975 and April 4, 2020. 359 studies related to the museum education were detected in this scan. It was determined that out of these records, 148 of them (%41,22) were included in education/educational research category. The analyses revealed that the type of publications which was encountered mostly were academic articles with 148 studies. In addition to this, it was found that 109 articles were published in the last five years. This rate exhibits that the educational research about the museum education has gained acceleration in recent years. It was detected in the analyses that a total of 470 different key words were used in 148 articles. Moreover, the analyses revealed that the most effective journal was "Journal of Museum Education". It was determined by the analyses that the researchers from 25 different countries published articles that made contributions to the field. Within this context, it was found that the most active country was the USA and it was followed by Italy, Canada and England. Turkey is ranked 6 out of 25 countries with 7 publications and this shows that serious contributions are made in this field.

Introduction

Today, the role of museums and historical places in education has become much more effective and important. This role is also compatible with the concept of "lifelong learning" which includes the educational process of an individual starting from the pre-school education and continuing to his old age. Thus, the thing that increases the importance of the collaboration between the school, the most fundamental educational institution, and the museums is the quite open, clear, and important relationship between historical places and museums because the idea of "museum education" is a positive approach for the schools and museums to collaborate (Işık, 2016).

Learning activities continue constantly in this age when knowledge is generated rapidly, during

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a period when it has become easier to reach it. In today's briskly globalizing world, the countries started to include many subjects and examples about museum education and museums in their coursebooks and in social studies and history education curricula.

Museums which are the places to carry the past to present, undoubtedly come to mind as one of the most ideal teaching fields. Learning via field trips and observation whilst teaching social studies and history topics find a meaning through being purposeful learning experiences that will be performed in museums and historical places. The importance of use of museums which are found in students' immediate surroundings and as places that are structures with a historical value and where objects are displayed in social studies courses is apparent (Meydan, 2014). In addition to its known responsibilities, museums have also undertaken a mission pertinent to education which is highly important today. In order to keep intercultural communication and interaction alive and ensure the continuity of museum trips and keep their important place in education, museums have to fulfil their educational mission (Işık, 2016). If there is a variety of museums, this will enable to have gains and content that will nearly correspond to every unit in social studies courses (Altın & Atçı, 2014).

Bringing the whole past, changes, and developments belonging to the human beings together with the audience depend on the effective presentations carried out in the museums. Museums are indeed important places with educational value as they develop students' flexible and creative opinions, contribute positively to the stages of gaining knowledge, thinking, questioning, and problem solving, and to developing imagination. Thusly, using museums as a learning environment will play an effective and positive role on cognitive, social, and affective domains and increase their interest, desire, and enthusiasm (Buyurgan, 2019). It is crucial that teachers will not only provide students with opportunities to establish emotional and imaginary links with the past during their visits to museums, historical places, and galleries for the sake of social studies/ history education but also the effectiveness of these visits to the above mentioned places depend on using imagination (Kabapınar, 2014). Museums provide important opportunities for students to learn their past actively and to gain interactive outcomes about the past (Güven, Bıkmaz, İşcan & Keleşoğlu, 2014).

Informal learning, which is defined as learning that occurs away from a structured, formal classroom environment on its own, includes everything that is carried out with the purpose of socialisation and making an attempt to give meaning to life. In this context, such places as museums, virtual museums, shopping malls, zoos, botanical gardens, parks, and so on, TV programs, internet sites, newspapers, books, and journals offer a fair number of opportunities for informal learning. When out of school settings are mentioned, trips and activities that are designed and developed with specific purposes must be considered instead of learning that occurs spontaneously without any plans and programs. Museums and archaeological sites are amongst the places that are referred to actively for education outside the school in social studies education. To that end, it was revealed in plentiful studies that educational activities carried out out of school settings made contributions to students' learning through fun engagements in a permanent fashion (Altın & Demirtaş, 2014; Arıcı, 2013; Bostan Sarıoğlan & Küçüközer, 2017; Bozdoğan, 2008; Ertaş, 2012; Laçin Şimşek, 2011). In fact, the studies carried out about the importance of museums in education revealed that learning is no longer limited to the course books and schools. It is accepted that museums are suitable settings for individuals' education considering both cognitive, affective, and psychomotor skills. Thereupon, museums and historical places play a crucial role in teaching individuals how to develop knowledge, in gaining the habit of reasoning and using thinking skills. Museums provide information that lessons, and books cannot clearly display thereby helping the education of more qualified

individuals (Işık, 2016). As a matter of fact, not only do museums make it easier for students to perceive abstract concepts but also they enable them to examine events and objects on-site. Museum activities also contribute to the socialization of students. Therefore, to do research, to develop their inquiry skills and a sense of curiosity, to trust themselves, to improve their aesthetic perspectives and creativity in many ways are enabled (Bozdoğan & Sünbül, 2016).

As a learning environment, museums have a special importance in teaching social studies courses. As has been mentioned earlier in this manuscript, museums have an alternative and complementary function to coursebooks, teachers, newspapers and televisions and many more. They assist in achieving the course goals of social studies courses related to human activities and events within the context of past and present (Ata, 2015).

Museums and historical sites and education can be beneficial by working together for gaining knowledge, skills and values within the scope of social studies education Thence, it is worthwhile to state that museums and historical sites must be visited by elementary and secondary school students, and activities as well as studies must be conducted throughout the trip for most of the real examples available within the scope of the social studies course exist in museums (Işık, 2016).

There are many scientific studies carried out about museums and museum education. One of the sources which these studies reach the potential readers/target audience is the scientific journals in which the studies that are carried out via scientific procedures are given. These scientific journals play an important role for the scientists to share their findings which they obtained via trips, observations, and experiments with the academia. Thus, a communicative and an interactive field occurs in the academic world. In this context, scientific academic periodicals have a distinctive importance for the continuity of scientific studies and sharing of the aforementioned knowledge. With the intention of guiding new studies and identifying trends in a discipline or subject area in recent years, studies involving bibliometric analyses have frequently been resorted to. These analyses are systematic methods that analyse bibliometric indicators in various types of academic publications (Karagöz & Koç Ardıç, 2019).

When the literature is examined, studies including bibliometric analysis in varying fields are encountered such as communication (Fombona, Pascual-Sevillana & Gonzalez-Videgaray, 2017; Navarro-Beltrá & Martín-Llaguno, 2013), administration (Avelar, da Siva-Oliveria & da Silva Pereira, 2019; Berbegal-Mirabent, Alegre & Ribeiro-Soriano, 2018), linguistics (Lei & Liu, 2019, Yilmaz, Topu & Tulgar Takkaç, 2019), philosophy (Fernandez & Sundström, 2011), music (Diaz & Silveira, 2014; Hancock, 2015), sports (Ciomaga, 2015) and social studies (Lara-Aparicio, Mayorga-Vega & Lopez-Fernandez, 2019; Pérez-Gutiérrez & Gutierrez-Garcia, 2015; Porto-Maciel, Araldi & Andrade, 2019) and also many others that are not included here.

The studies with bibliometric analyses in education and educational research fields frequently exist in literature in the following areas: Science education (Bozdoğan, 2020), educational technology (Chen et.al, 2019; Chen, Zou & Xie, 2020), teacher education (Ciftci et.al, 2016), sustainable development and education (Doğru, Güzeller & Çelik, 2019); higher education (Fitzgerald & Jiang, 2020; Lucena et.al, 2019; Zheng, 2018), education supervision (Guerrero et.al, 2020); educational leadership and management (Hallinger, 2019; Hallinger & Kocacevic, 2019), creativity and education (Hernandez-Torrano & Ibrayeya, 2020), educational improvement (Kovacevic & Hallinger, 2019), mother tongue education (Karagöz & Koç Ardıç, 2019; Mutlu, 2018), learning communities (Moosa & Shareefa, 2020), education (Lorenzo,

Lorenzo-Lledó, Lledó Carreres & Pérez-Vázquez, 2020); research administration (Pineda, Gregorutti & Streitwieser, 2020), adult education research (Rubenson & Alfert, 2015), physical education (Santos Labrador, 2015), information technology (Toro et.al, 2020), quality assurance in education (Swain, 2014), Turkish education (Şeref & Karagöz, 2019; Varışoğlu, Şahin & Göktaş, 2013), engineering education (Xian & Madhavan, 2014), sports health education (Zhang, 2017).

However, no studies spotted in the bulk of literature doing the bibliometric analyses of the published studies conducted on museum education in the field of education. It is considered that this study will fill the deficiency in this field and will pave the way for the researchers who want to carry out studies related to this field. The present study aimed at investigating the scientific publications in terms of bibliometric perspectives. That is to say, the study is on the scientific publications about museum education with regard to bibliometric indicators and presents a new research perspective to the academic field of social studies. Another purpose of this study is to contribute to creating a road map by giving light to those who will work in this field in the future. In this context, publications in the Web of Science categories were investigated by using the "museum education" key word, types of publications, key word networks, numeric distribution according to the years, total number of citations, mostly cited papers, active/effective researchers, active/effective periodicals journals, mostly cited journals, effective countries, effective institutions, publication languages, supporting funds, papers published in Turkey.

To this end, the study sought to answer the question "What are the bibliometric indicators of the articles related to "museum education" categorized in Web of Science (WoS)?". Hereby, the development of research in the field of "museum education" can be examined.

Method

Design of the study

Case study method, one of the qualitative research methods that provide in-depth, and detailed examination of a particular event or a phenomenon was used in this study (Yıldırım & Şimşek, 2018).

Case studies are based on an in-depth investigation or description of a single individual, group or event to explore the causes of underlying principles such as problems, illnesses, applications, people, and phenomena. Considering the fact that the phenomenon is important, the variables that are responsible for the formation of the case are revealed with different data collection tools such as observation and document analysis. It is within the bounds of possibility that the interactions between the so-called variables may be revealed or different situations may be compared (Şimşek, 2012). Based on the questions such as "what", "how" and "why", case studies provide opportunities for the in-depth investigation of an event or a phenomenon that the researcher cannot control. Thereupon, case study is a key approach that is resorted to whilst seeking answers to the scientific questions and offers an opportunity for the use of both qualitative and quantitative data. An event or a phenomenon investigated with this method is examined within its natural context with restricted time and space (Büyüköztürk, Kılıç Çakmak, Akgün, Karadeniz & Demirel, 2014; Yıldırım & Şimşek, 2018; Kaleli Yılmaz, 2015).

Case study was preferred in this study based on investigating the published articles about museum education in the category of education/educational research in terms of bibliometric

variables and thus revealing the current situation.

Data Collection Process

The bibliometric analysis process was performed as follows:

(1) An online scanning was performed in WoS database. The scan interval involved the dates between 1975 and April 4, 2020.
(2) The key word "museum education" was scanned both in titles and content of the publications in this scanning.
(3) The indexes scanned were identified as SCI-Expended, SSCI, A&HCI, CPCI-S, CPCI-SSH, BKCI-S, BKCI-SSH.
(4) During the scanning process, out of total 65.128.419 records, 359 records related to the subject field were reached. Out of these 359 records, only 204 of them are included within the context of Education/Educational Research and this study was limited to the academic papers which are the most recorded type among them.

Analysis of data

The data obtained from the study were analysed via bibliometric analysis technique. In bibliometric studies, publications or documents' specific features are analysed and findings for scientific communication are obtained. In bibliometric analysis, while the most efficient researchers and scientists in any field or on any topic are detected, the dimensions of interaction between these studies are revealed. Bibliometric studies provide opportunities to compare and contrast between the countries, institutions, approaches, or schools on different topics (Al, 2008)

The data were presented in tables and as figures in this study. Free VOSviewer (Version 1.6.13) package program (Van-Eck & Waltman, 2009) was used in the study to create and visualize bibliometric maps of the key word network analysis (Figure 1) of the published papers about museum education in the category of education/educational research and the journals' citation analysis (Figure 4).

Findings

In this study, the articles published in Web of Science (WoS) were evaluated using bibliometrics and visualized with the help of VOSviewer analytical tool. Findings obtained in the study are presented in sections below.

WoS categories of 359 studies that were revealed as a result of online scanning were examined and the first 8 categories were presented in Table 1.

Table 1. WoS Categories of the Publications Scanned with the "Museum Education" Key Word (First 8 categories)

Web Of Science Categories	Record Count
1. Education/Educational Research	148
2. Art	13
3. Computer Science Interdisciplinary Applications	2
4. History of Social Sciences	2
5. Anthropology	1

6. Cultural Studies	1
7. History Philosophy of Science	1
8. Language Linguistics	1

According to Table 1, the maximum recordings with 148 studies were included in the "Education/Educational Research" category and the studies included in the following categories follow them: "Art with 13 studies, "Computer Science Interdisciplinary Applications" and "History of Social Sciences" with 2 studies, and "Anthropology, Cultural Studies, History Philosophy of Science" and "Language Linguistics" with 1 study.

The publications in the education/educational research category were examined in terms of their types and presented in Table 2.

Table 2. Types of Publications about the Museum within the Context of Education Education/Educational Research

Document Types	Record Count
1. Article*	148
2. Book Chapter	16
3. Early Access	2
4. Proceedings Paper	1

Considering Table 2, the most common published papers were articles (148 studies) and they were followed by book chapters (16), early accesses (2) and a proceedings paper (1).

The key words of the articles about museum education in education/educational research category were examined and the key word networks were presented in Figure 1.

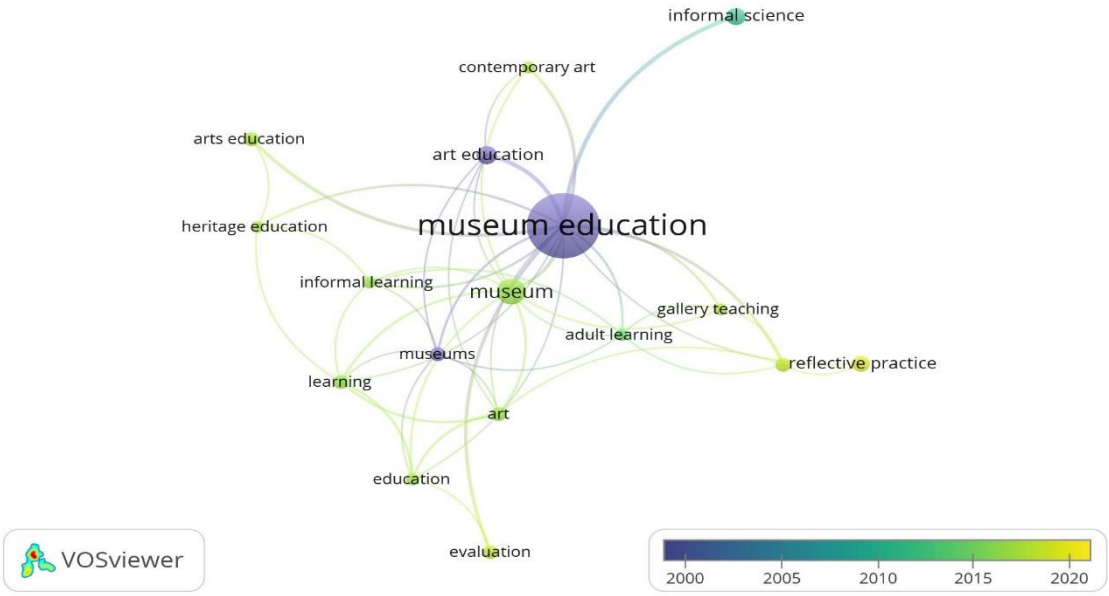

Figure 1. Key words and current issue analysis (N=148)

It was observed during the research that 470 different key words were used in the articles. When Figure 1 was examined, it was found that the most common key words used were the museum education, museum and art education. Especially in 2000s, key words such as museum education, museum and art education were commonly included, but in recent years, it is

observed that there is a tendency towards key words such as evaluation, education, reflective practice, and gallery teaching.

The distribution of the published articles about museum education in education/educational research category were examined considering their years of publication and presented in Table 3.

Table 3. The Distribution of the Published Articles about Museum Education in Education/Educational Research Category Considering their Years of Publication (N=148)

Publication Years	Record Count	%	Publication Years	Record Count	%
2020	3	2.02	2011	1	0.67
2019	25	16.89	2010	5	3.37
2018	20	13.51	2009	3	2.02
2017	19	12.83	2008	2	1.35
2016	26	17.56	2007	2	1.35
2015	16	10.81	2006	2	1.35
2014	6	4.05	2001	1	0.67
2013	6	4.05	2000	1	0.67
2012	10	6.75			

The distribution of the published articles about museum education in education/educational research category considering their years of publication was presented in Figure 2.

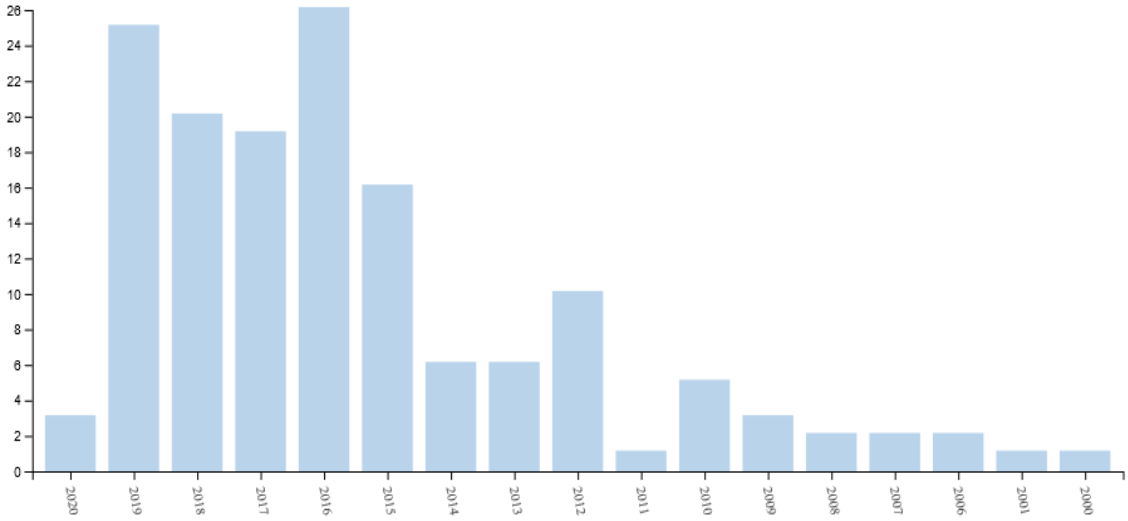

Figure 2. Distribution of the articles according to years of publication (N=148)

Considering the published articles about museum education in education/educational research category, it was found that it was in 2016 when the maximum number of articles (26 articles) were published. It was determined that the years 2019 (25 articles), 2018 (20 articles), 2017 (19 articles) and 2015 (16 articles) followed the year 2016. It is seen that among the published articles, 73,62% of them (109 articles) were published in the last five years including 2020.

The total number of citations about museum education in education/educational research category according to the years were presented in Figure 3.

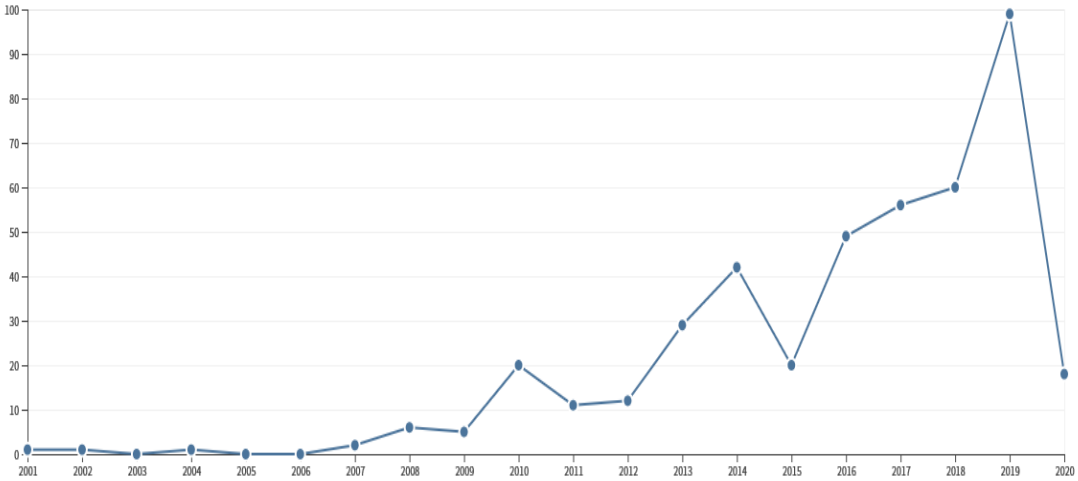

Figure 3. The total number of citations according to the years (N=148)

The total number of the citations about the published articles related to the museum education in education/educational research category according to the years was 434 and the total mean citation was 2,93, and h-index value was 9.

The published articles about museum education in education/educational research category in terms of citations were examined and presented in Table 4.

Table 4. The Most Cited 10 Articles about Museum Education in Education/Educational Research Category

Article Title	Author(s)	Publication Year	Journal	Sum of Times Cited	Average Citations per Year
1. School visits to natural history museums: Teaching or enriching?	Tal, T.; Morag, O.	2007	Journal of Research in Science Teaching	61	4,36
2. Free-choice worksheets increase students' exposure to curriculum during museum visits	Mortensen, M.F.; Smart, K.	2007	Journal of Research in Science Teaching	43	3,07
3. Science Learning in a Leisure Setting	Falk, J. H.; Storksdieck, M.	2010	Journal of Research in Science Teaching	41	3,73
4. The Role of Learning in the Development of Expertise in Museum Docents	Grenier, R. S.	2009	Adult Education Quarterly	27	2,25
5. Learning to Think Critically: A Visual Art Experiment	Bowen, D. H.; Greene J.P.; Kisida, B.	2014	Educational Researcher	23	3,29
6. Clarifying the Complexities of School-Museum Interactions: Perspectives From Two Communities	Kisiel, J.F.	2014	Journal of Research in Science Teaching	21	3,00
7. School Trips and Classroom Lessons: An Investigation into Teacher-Student Talk in Two	Dewitt, J.;Hohenstein, J.	2010	Journal of Research in Science	17	1,55

Settings			Teaching		
8. A day at the museum: The impact of field trips on middle school science achievement	Whitesell, E.R.	2016	Journal of Research in Science Teaching	12	2,40
9. Using inquiry-based instruction to encourage teachers' historical thinking at historic sites	Baron, C.	2013	Teaching and Teacher Education	11	1,38
10. Requirements elicitation for virtual actors in collaborative learning environments	Economou, D.; Mitchell, W.L; Boyle, T.	2000	Computers & Education	9	0,43

When Table 4 was examined, it was found that the most cited study was the article entitled "School visits to natural history museums: Teaching or enriching?" by T. Tal and O. Morag published in "Journal of Research in Science Teaching". This article published in 2007 was cited 61 times and its annual mean citation rate was 4,36. This article was followed by an article published by "M.F. Mortensen and K. Smart in the same journal in the same year with 43 citations and 3,07 mean citation rate. The third article was published by J.H. Falk and M. Storksdieck in the "Journal of Research in Science Teaching" and it has 41 citations and 3,73 mean citation rate.

The researchers who made the maximum contributions to the field and the number of their publications were examined within the context of the published articles about museum education in education/educational research category and presented in Table 5.

Table 5. The First Ten Authors Who Made the Maximum Contribution to the Field and the Number of Their Publications within the Context of Museum Education in Education/Educational Research Category (N=148)

Authors	Record Count
1. Sobanova, P.	6
2. Nardi, E.	4
3. Greene, J.P.	3
4. Hubard, O.	3
5. Poce, A.	3
6. Agrusti, F.	2
7. Bowen, D.H.	2
8. Delibaltova, V.	2
9. Dicindio, C.	2
10. Hein, G.	2

It was determined in the analyses that 234 different authors (single author/multiple authors) published articles that contributed to the field. Considering Table 5, the authors who made the maximum contributions were listed as follows, respectively: Sobanova, P. (6 articles), Nardi, E. (4 articles) and Greene, J.P.,Hubard, O. and Poce, A. (3 articles).

Examining the active journals within the context of the published articles about museum education in education/educational research category, the journals which published more than

two articles were presented in Table 6.

Table 6. The Active Journals Publishing More than Two Articles within the Context of the Published Articles about Museum Education in Education/Educational Research Category(N=148)

Source Titles	Record Count	%
1. Journal of Museum Education	48	32.43
2. Journal of Research in Science Teaching	8	5.40
3. Cadmo	7	4.73
4. Museum Education	5	3.37
5. Muzejni Edukace	5	3.37
6. International Journal of Art and Design Education	4	2.70
7. International Journal of Education Through Art	4	2.70
8. Egitim ve Bilim-Education and Science	3	2.02
9. Etd Educacao Tematica Digital	3	2.02

According to the analysis carried out, it was found that articles were published in 63 different journals. In this vein, when Table 6 was examined, it was revealed that the maximum number of articles were published in "Journal of Museum Education" (48 articles). "Journal of Research in Science Teaching" (8 articles) and "Cadmo" (7 articles) followed it, respectively.

The published articles about museum education in education/educational research category were examined and the most cited journals and citation networks were presented in Figure 4.

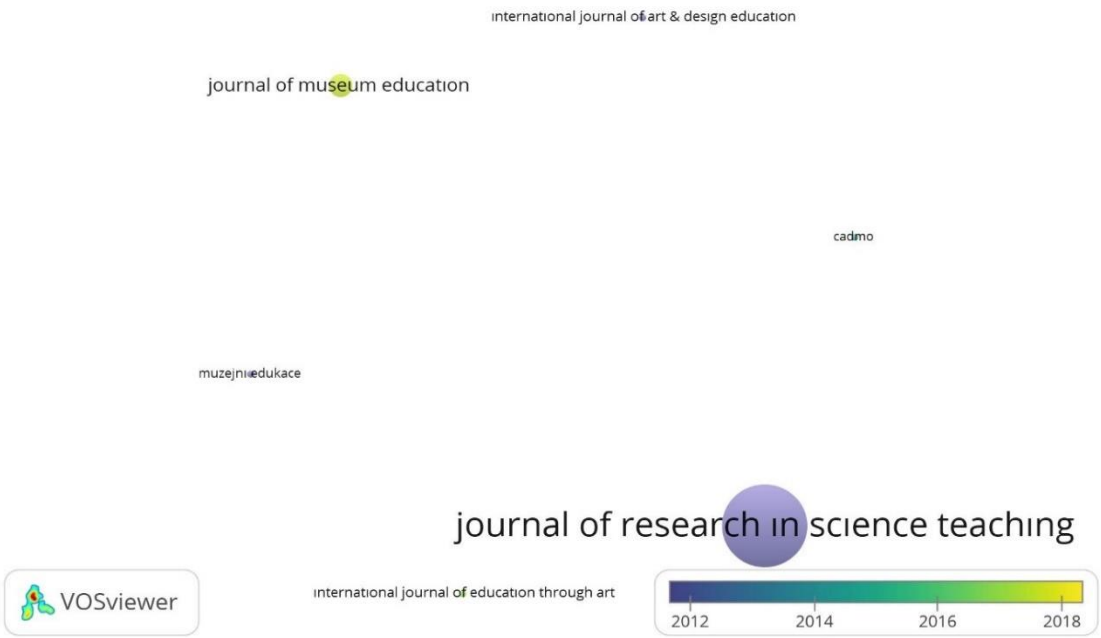

Figure 4. The Most Cited Journals and Citation Networks (N=148)

It was found in the analysis that the articles in 63 different journals were cited. When Figure 4 was examined, it was revealed that "Journal of Research in Science Teaching" was the most cited journal. This journal was followed, respectively by "Journal of Museum Education", "International Journal of Art and Design Education and "International Journal of Education Through Art".

In which countries the articles about museum education in education/educational research category were published were explored and the countries which hold more than two publications were presented in Table 7.

Table 7. The Active Countries Which Hold More Than Two Published Articles about Museum Education in Education/Educational Research Category (N=148)

Countries/Regions	Record Count	%	Countries/Regions	Record Count	%
1. USA	67	45.27	7. Spain	6	4.05
2. Italy	10	6.75	8. Australia	3	2.02
3. Canada	8	5.40	9. Israel	3	2.02
4. England	8	5.40	10. New Zealand	3	2.02
5. Brazil	7	4.73	11. Scotland	3	2.02
6. Turkey	7	4.73			

When Table 7 was examined, it was revealed that the maximum number of articles was published in the Unites States of America (67 articles). Italy (10 articles), Canada (8 articles) and England (8 articles) follow the USA. Turkey with 7 articles ranks 6th in April, 2020.

In which institutions the researchers who published articles about museum education in education/educational research category worked were explored and the institutions which published 3 articles and above were presented in Table 8.

Table 8. The Active Institutions Within the Context of Published Articles About Museum Education in Education/Educational Research Category (N=148)

Organizations	Record Count	%
1. Roma Tre University	6	4.05
2. Brooklyn Museum	4	2.70
3. King's College London	3	2.02
4. Lesley University	3	2.02
5. University of Arkansas	3	2.02
6. The University of Edinburgh	3	2.02
7. University of Sao Paulo	3	2.02

The analyses revealed that the published articles about museum education in education/educational research category belonged to the researchers working in 190 different institutions. When Table 8 was examined, it was found that the most active institution was Roma Tre University. The publication languages of the published articles about museum education in education/educational research category were presented in Table 9.

Table 9. The Active Publication Languages Within the Context of Published Articles About Museum Education in Education/Educational Research Category (N=148)

Languages	Record Count	%
English	121	81.75
Czech	6	4.05
Spanish	6	4.05
Italian	5	3.37
Portuguese	4	2.70

French	2	1.35
Bulgarian	1	0.67
German	1	0.67
Russian	1	0.67
Turkish	1	0.67

Considering Table 9, it was found that among the 121 published articles, the publication language was English. The study explored which funds supported the published articles about museum education in education/educational Research Category and five institutions were presented in Table 10 (N=148)

Table 10. The Funds That Supported the Published Articles About Museum Education in Education/Educational Research Category (N=148)

Funding Agencies	Record Count	%
1. Andrew W. Mellon Foundation	2	1.35
2. Institute of Museum and Library Services	2	1.35
3. National Science Foundation	2	1.35

It was found in the analyses that 27 different funds supported the published articles. According to Table 10, 6 articles were supported by "Andrew W. Mellon Foundation", "Institute of Museum and Library Services" and "National Science Foundation". The information pertaining to 7 Turkish articles published in the education/educational research category was examined and it was found that their total number of citations was 8, the total mean citation rate was 1.14, h-index value was 2. The cited 8 articles were presented in Table 11.

Table 11. The Articles Published About Museum Education in Education/Educational Research Category in Turkey (Total 8 citations, Total Mean Citation =1,14)

Article Title	Author(s)	Publication Year	Journal	Sum of Times Cited	Average Citations per Year
1. The Museum Of Innocence: Five Concepts For Challenging The Status Quo In Art Education	Soganci, I. O.	2017	International Journal of Education Through Art	3	0,75
2. The Effect of Active Learning Techniques on Class Teacher Candidates' Success Rates and Attitudes toward their Museum Theory and Application Unit in their Visual Arts Course	Dilmac, O.	2016	Educational Sciences-Theory & Practice	2	0,40
3. Effect of Museum Education on Teaching Extinct Animals Lived in Anatolia to Pre-School Children	Dilli, R.; Dumenci, S.B.	2015	Egitim ve Bilim-Education and Science	2	0,33
4. Development of Creative Drama in the Museum as a Teaching Method in Turkey	Okvuran, A.	2012	Egitim ve Bilim-Education and Science	1	0,11
5. Analysing School-Museum Relations to Improve Partnerships for Learning: A	Ates, A.;Lane, J.F.	2020	Egitim ve Bilim-Education and	0	0,00

Case Study			Science		
6. "No Student Not Met Museum Education" A Practice of Volunteer Education Program in the Museum	Yetkiner, A.; Karadeniz, C.; Gokaslan, Z.C.	2019	Journal of Education and Future-Egitim ve Gelecek Dergisi	0	0,00
7. Discussion on the Concept of Visual Culture at Museum within Postmodern Art Education	Cildir, Z.	2015	Journal of Education and Future-Egitim ve Gelecek Dergisi	0	0,00

When Table 11 was examined it was determined that Turkey's first article about the content field was the article with 3 citations published in International Journal of Education Through Art" in 2017 by Soganci, I.O.

Discussion and Conclusion

The study revealed that among the 65.128.419 studies registered on WoS data base between 195 and April 4, 2020, 359 of them were about museum education. Out of these studies, 148 of them (41,22%) were included in the education /educational research category. It can be stated that most of the studies carried out about museum education on WoS data base were included in the education /educational research category.

According to the analysis, it was revealed that the most records about museum education were articles (148 publications). It can here be stated that articles provide concrete and objective indicators for scientists to present their studies and productivity; thus, they might have been chosen as the most popular ones. In addition, the bibliometric analyses carried out indicate that articles are the types of publications that are mostly included in literature. It is found that there are similar studies in literature (Chao, Yang & Jen, 2007; Chiu & Ho, 2007; Karagöz & Koç Ardıç, 2019; Karagöz & Şeref, 2019; Koley & Sen, 2016).

According to another finding, it was found that a total of 470 key words were used in 148 articles. It was observed that the most commonly used key words in the articles were museum education, museum and art education. It is witnessed that there is especially the tendency towards such key words as evaluation, education, reflective practice, gallery teaching in recent years. This tendency exhibits that museum education within the context of educational sciences concentrate on studies such as reflection, reflective thinking, reflective teaching and learning, and evaluation.

It was detected that the first article about museum education in education/educational research category was published in 2000 and 2016 was the year when the articles (26 articles) were most frequently published. Among the published articles, it was revealed that 109 of them (73,62%) were published in the last five years including 2020. It can be concluded from this rate that educational research about museum education has been carried out more in recent years and the awareness of museum education has increased positively.

It was found that by the moment the scanning was done, the total number of citations for the 148 articles published in education/educational research category was 434, the total mean citation rate was 2,93, and h-index value was 9. It was revealed that the number of citations increased by the year of 2008 and the citations especially peaked in the last five years. It was

observed within this context that the most cited study was the article by Tal, T. and Morag, O. titled as "School visits to natural history museums: Teaching or enriching?". The most cited articles become a guide for the future studies and also considering the fact that there are qualified studies which have not been cited yet, it could be wrong to evaluate the academic publications with the number of their citations (Eshraghi, Osman, Gholizadeh, Ali & Shadgan, 2013).

According to another finding, there were 330 authors who made contributions to the field. It was found out that the most active authors were "Sobanova, P.", "Nardi, E." and "Greene, J.P", respectively. It is suggested that the researchers who want to carry out studies about museum education should develop their perspectives and also examine the studies of the aforementioned active authors to receive the necessary guidance for their studies.

Still another finding demonstrated that the articles were published in 63 different journals. The most effective journal was determined as "Journal of Museum Education". "Journal of Research in Science Teaching" and "Cadmo" follow it, respectively. As can clearly be seen, studies addressing museum education are accepted by the important journals of educational sciences. This can encourage potential researchers who want to conduct a study addressing museum education in the field of education to complete their studies and share their findings with the academic sphere through these journals.

It was found that the journal which was most cited in education/educational research category was "Journal of Research in Science Teaching". It was followed by "Journal of Museum Education", "International Journal of Art and Design Education" and "International Journal of Education Through Art". It was spotted that the first two journals which were most cited and where the most publications were made about museum education are the same. These two journals are indeed among the most prestigious journals that include studies about museum education.

The analyses carried out pointed to the fact that researchers from 25 different countries published articles that made contributions to the field. The most active country was the USA followed by Italy, Canada, and England. Turkey ranks 6th with 7 articles, and it can be interpreted that Turkey hosts important studies carried out in the field.

Considering the analysis results, 190 different institutions were mentioned in the published articles. It was revealed that "Roma Tre University" and "Brooklyn Museum" were the most active institutions. Ankara University in Turkey with two publications situated itself amongst the scholarly work beside these institutions by making solid contributions to the field.

Via examining the publication languages of the published articles, it was understood that 121 articles (81,75%) were published in English. Due to the acceptance of English as the communication language of international academic settings, this is normal. In addition to this, the publication language of journals in WoS and many other databases is predominantly English, which is inescapably influential in this finding. Similar findings were obtained in many studies carried out before (Bordons & Barrigón, 1992; Macías-Chapula & Mijangos-Nolasco, 2002; Tsay, 2008).

According to another result, 27 different funds supported the published articles. It was observed that 6 articles were supported by "Andrew W. Mellon Foundation", "Institute of Museum and Library Services", and "National Science Foundation". It can be highlighted that the support

given by the funds to the scientific research can make positive contributions to the number of publications. Considering this, one can deduce that the support given by the Scientific and Technological Research Council of Turkey (TUBİTAK) and Scientific Research Projects (BAP) by the relevant university units to the research studies can help boost the number of publications.

The analyses carried out unearthed that there were articles written on the subject area in Turkey. Seven articles were determined and it was reported that the total number references to these articles was 8, the total mean citation rate was 1,14, and h-index value was 2. In addition, it was noted that the first article from Turkey about the subject area was published in 2012 among the journals indexed in WoS database.

This study explored the articles related to the museum education in education/education research category in WoS database. In this context, in terms of delimitation it could be expressed that the study involves the studies included solely in the WoS database.

Considering that this study was conducted on the articles listed on "museum education" in WoS, bibliometric studies can be suggested for other out-of-school educational environments.

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