



Research Paper

A Bibliometric Analysis on Virtual Tourism

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Abstract	Manuscript Information
<p>Background: Technology in all its facets of evolution has undoubtedly improved and developed all areas of human life. Without exception, it is helping the travel and tourism industry to grow ambitiously through virtual tools such as travel photography, blogs, travel booking websites, etc. Virtual tourism is a hybrid concept that combines neuroscience, behavioral economics, and social psychology with the cutting-edge technologies of virtual and augmented reality, and is a futuristic transformation that will revolutionize the industry.</p> <p>Purpose: The paper aims at examining the developments in the field of virtual tourism in the last five years (2018-2022) to know the research implications and to provide future research direction by uncovering the emerging areas of growth in this field.</p> <p>Focus & Methodology: We will employ bibliometric analysis of 299 articles from UGC journal list group II extracted from the dimensions database using the Vos viewer package for bibliometric analysis.</p> <p>Results: Researchers' enthusiasm for virtual tourism is increasing. The main research areas related to virtual tourism include commerce, management, tourism, and services. Ryan Yung and Brent don Moyle, both from Griffith university, Australia, and Myung Ja Kim from Kyung Hee university, South Korea, are the most popular researchers in this field. Sustainability and tourism management are the main journals. Griffith university, Hong Kong polytechnic university and Manchester metropolitan university contribute the most. China, the United States, and the United Kingdom are the countries with the most contributions to publications on virtual tourism. The most frequently mentioned keyword is Covid. Tourism marketing is the most relevant keyword.</p> <p>Conclusion: Virtual tourism is an attractive area of research that offers many opportunities for exploration and applied research. This bibliometric analysis of virtual tourism can provide the researchers a new direction for their investigations in the area of virtual tourism.</p>	<ul style="list-style-type: none"> ▪ ISSN No: 2583-7397 ▪ Received: 21-05-2024 ▪ Accepted: 12-06-2024 ▪ Published: 16-08-2024 ▪ IJCRM:3(4); 2024: 152-161 ▪ ©2024, All Rights Reserved ▪ Plagiarism Checked: Yes ▪ Peer Review Process: Yes <p>How to Cite this Manuscript</p> <p>Umamaheswari R, Mohanadasan T. A Bibliometric Analysis on Virtual Tourism. International Journal of Contemporary Research in Multidisciplinary.2024; 3(4): 152-161.</p>

Keywords: Virtual tourism, Bibliometric analysis, Citations, Publications.

1. INTRODUCTION

Technology in all its facets of evolution has undoubtedly improved and developed all areas of human life. Without

exception, it is helping the travel and tourism industry to grow ambitiously through virtual tools such as travel photography,

blogs, travel booking websites, etc. Virtual tourism is a hybrid concept that combines neuroscience, behavioral economics, and social psychology with the cutting-edge technologies of virtual and augmented reality, and is a futuristic transformation that will revolutionize the industry. It allows people to experience the tourist spots without actual travel. The major attraction of virtual tourism is, it makes tourism available and affordable to common man too which is otherwise available only to the higher status group of the society. Virtual tourism takes different forms and has different technical capabilities. virtual tourism may consist of a video about a destination. The 'tourist' watches the video using their auditory and visual senses. Virtual tourism encompasses a broad spectrum of digitally mediated reality, including mixed reality and augmented reality in addition to virtual reality. Among the greatest advantages of virtual tourism are that one can visit places without leaving one's home, one can visit inaccessible and unavailable places, one can visit places in the past, it serves as a tool for marketing and promoting tourism, it enhances the tourism experience, physical vacations are replaced by virtual experiences. Despite these advantages, virtual tourism is not accessible to all, does not provide the economic benefits as traditional tourism, has limited social interaction. The examples include virtual tourism to the great barrier reef, mount Everest, amazon rain forest, space etc are available. (Stainton, 2023) Bibliometric analysis is a scientific, computerized review method that identifies the most important research papers or authors and their relationships to each other by surveying all publications on a particular topic or field (Jieun Han, Gyu Hyun Kwon, 2020) VOS viewer is a software tool for creating and visualizing bibliometric networks.(VOS viewer-Visualizing Scientific Landscapes, n.d.) Dimensions is a database that provides the most comprehensive collection of linked data in a single platform; from grants, publications, datasets and clinical trials to patents and policy documents. (why did we build dimensions\Dimensions.n.d.) The search results from dimensions database are exported to VOS viewer software for further analysis. The paper aims at examining the developments in the field of virtual tourism in the last five years (2018-2022) to know the research implications and to provide future research direction by uncovering the emerging areas of growth in this field.

2. REVIEW OF LITERATURE

The concept of virtual tourism, which combines cutting-edge technologies such as virtual reality (VR) and augmented reality (AR), has become popular in recent years. Research has shown that virtual reality can recreate the sensory experience of traveling, engaging the user's neurological and psychological senses to create an immersive travel experience (Guttentag, 2018). Additionally, studies such as that of Kim *et al.*, (2019) studied the economic behavior of virtual tourists, revealing that virtual experiences can influence travel decisions and spending habits in the real world. Augmented reality (AR) has also been analyzed for applications in enhancing tourism experiences at heritage sites, significantly enriching tourists' understanding and engagement with cultural heritage (Choi & Ahn, 2020). The

COVID-19 pandemic has further fueled interest and growth in virtual tourism, as physical restrictions on travel have spurred a wave of virtual alternatives (Gössling *et al.*, event, 2020). These advances highlight the growing relevance of virtual tourism in modern travel behavior and its potential for sustainable tourism practices (Koo *et al.*, 2021).

Bibliometric analysis has emerged as an important tool for understanding trends and intellectual structures in the field of virtual tourism. Studies such as that of Hall (2018) have introduced bibliometric methods and their applications in tourism research, emphasizing the importance of citation analysis, co-citation and network analysis. For example, Zong and Zhang (2019) have mapped the intellectual structure of tourism research, providing insight into how key themes have evolved over time. Similarly, Cobo *et al.*, (2019) reviewed VR research trends in various fields, including tourism, highlighting the interdisciplinary nature of VR research. By analyzing sustainable tourism literature using bibliometric methods, researchers such as Jiang *et al.*, (2020) identified influential authors, organizations and research centers that illustrate the essential role of sustainability in contemporary tourism research. The combination of virtual tourism and bibliometric analysis reveals a number of research gaps and opportunities. While virtual tourism research has explored various aspects such as user experience, educational benefits, and economic impact (Huang *et al.*, 2022; Li & Chen, 2022), further research is needed. Further research combines bibliometric methods to systematically map virtual tourism develop and connect these themes. For example, studies focusing on the ethical considerations of virtual tourism (Ritchie & Hudson, 2022) could benefit from bibliometric analysis to understand the breadth and depth of discussion in this area. Additionally, the impact of virtual tourism on traditional tourism industries and long-term sustainable practices remains an under-researched area that bibliometric analysis can shed light on by identifying key trends and research gaps (Sigala, 2020)^[13]. The integration of virtual tourism and bibliometric analysis provides a comprehensive understanding of the field, highlighting the dynamic interaction between technology and tourism. Future research should take advantage of bibliometric methods to further explore the ethical, economic, and sustainable aspects of virtual tourism. This approach will not only explore emerging growth areas but also provide a systematic framework to guide future research, thereby contributing to the sustainable and inclusive development of the industry tourism.

3. RESEARCH QUESTIONS

The researchers want to probe in to the following felt research questions:

- RQ1:** What is the annual trend of virtual tourism publications?
- RQ2:** Which author, organization and journal contributed more to virtual tourism-based research?
- RQ3:** Which are the leading countries in the publication of virtual tourism papers?
- RQ4:** What are the popular keywords in the publication of virtual tourism papers?

4. METHODS

The global literature about virtual tourism published between last five years (2018-2022) were scanned in the dimensions database. The search term applied to identify the matching papers include “VIRTUAL TOURISM” which was used as the keyword. The document which includes the necessary information of authors, countries, organization, abstracts, counts

of citations were exported in a format for bibliometric mapping in VOS viewer. The date of the retrieval was 9/3/2023. VOS viewer (version 1.6.19) was used to analyze the citation, co-occurrence, co-authorship, co-citation, and bibliographic coupling. The criteria employed is shown in the table below.

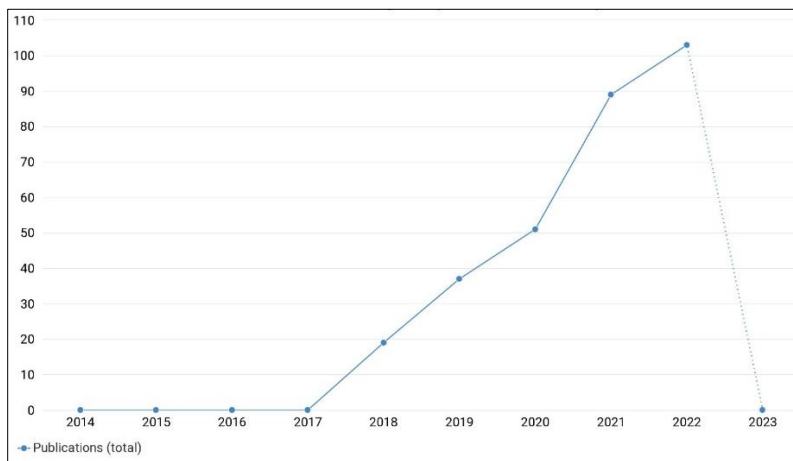
Table 1

Keyword	Virtual Tourism
Search In	Title and Abstract
Publication Year	2018 or 2019 or 2020 or 2021 or 2022
Fields of Research	Commerce, Management, Tourism and Services or Tourism or Marketing or Commercial Services.
Publication Type	Article
Journal List	UGC Journal List Group II

Source: Authors' Calculation using Dimensions

5. RESULTS

Figure 1: Yearly publication trend

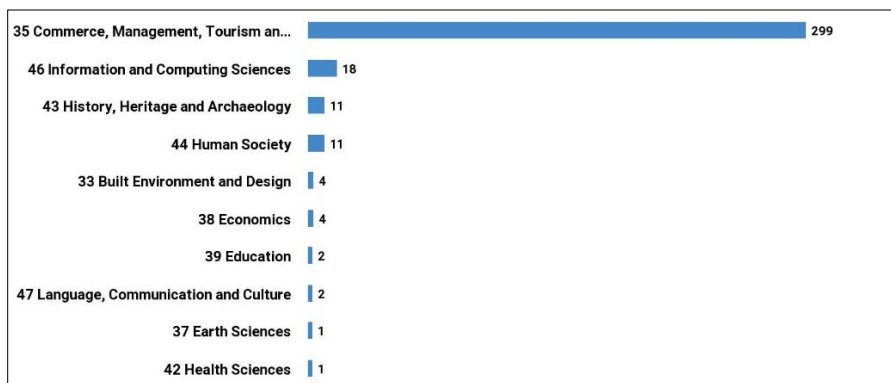


Source: <http://app.dimensions.ai>

Figure 1 shows that the number of publications in the field of virtual tourism has increased in the last five years (2018-2022). There is a total of 299 articles from UGC's care list II journals under the field of virtual tourism (searched only in title and

abstract) with 6K citations with a citation mean of 20.26 in the research categories of commerce, management, tourism, and services.

Figure 2: Number of publications in each research category



Source: <http://app.dimensions.ai>

Figure 2 shows that most of the articles on virtual tourism comes from the research category of commerce, management, tourism and services.

Table 2: List of top 10 most sources of publications

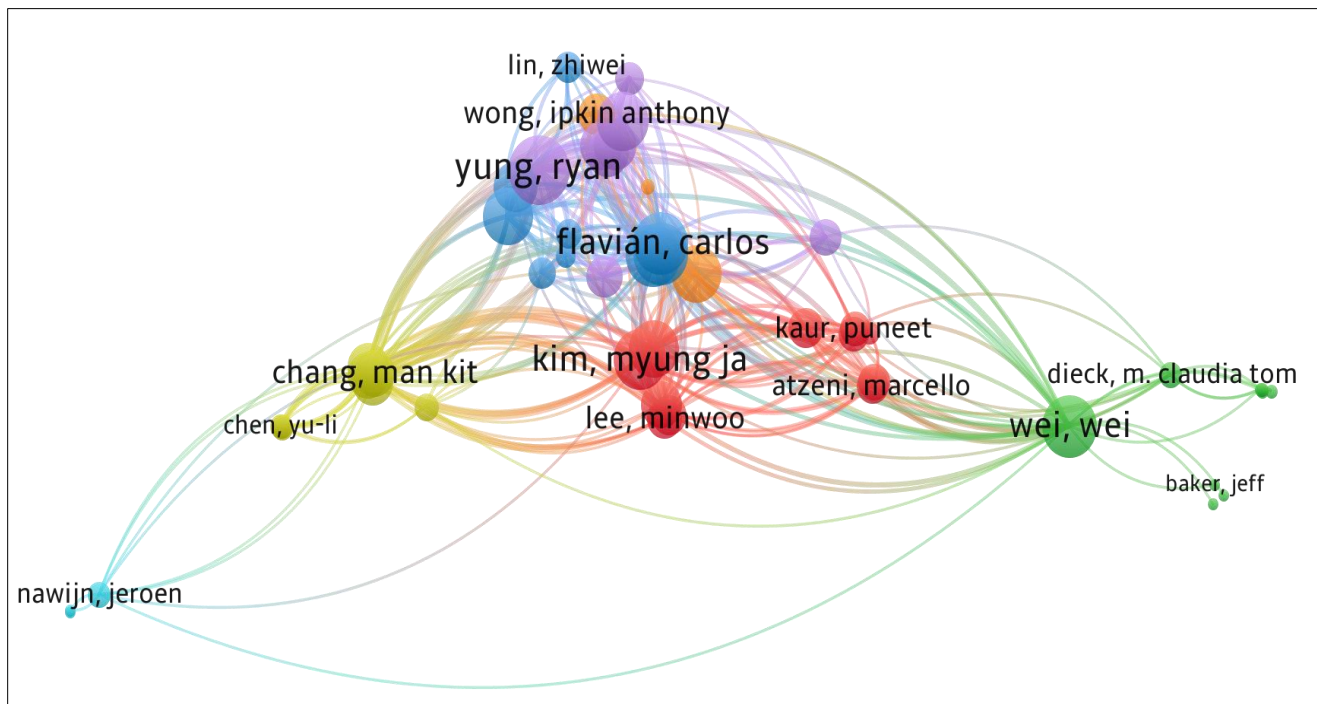
SL NO	Source	Publications	Citations	Citation Mean
1	Sustainability	37	348	9.41
2	Current Issues in Tourism	17	439	25.82
3	Tourism Management	16	1621	101.31
4	Journal of Hospitality and Tourism Technology	9	166	18.44
5	Information Technology and Tourism	8	141	17.63
6	Geo Journal of Tourism and Geosites	8	13	1.63
7	Journal of Sustainable Tourism	7	138	19.71
8	Journal of Vacation Marketing	7	29	4.14
9	Journal of Hospitality and Tourism Management	7	109	15.57
10	International Journal of Contemporary Hospitality Management	6	82	13.67

Source: <http://app.dimensions.ai>

It is inferred from Table 2 that the journal *Sustainability* has contributed a larger number of publications (37) to the field of virtual tourism, but according to the citation mean, the journal *Tourism Management* has the highest number of citations with a

mean of 101.31. Therefore, *Tourism Management* can be considered as the representative journal in the field of virtual tourism.

Figure 3: Bibliometric analysis of Author’s citation

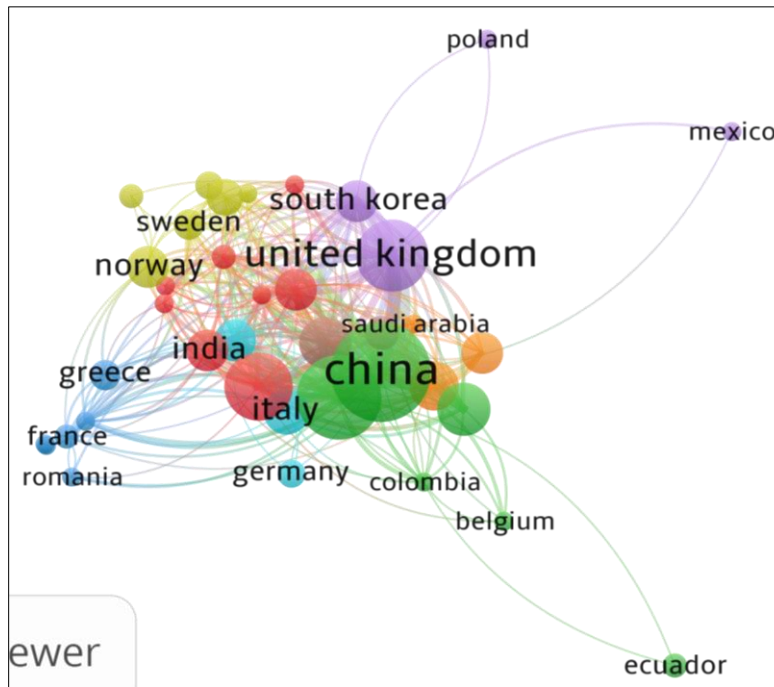


Source: Authors’ Calculation using VOS viewer

Citation analysis of authors measures the relative importance of an author by considering the frequency that he has been cited in other papers. To analyze the citation of authors the minimum number of documents of an author is given as 2 and minimum number of citations of an author is also given as 2 since virtual tourism is an emerging phenomenon. 59 authors among 834 meet the threshold. For each of the 59 authors, the total strength of citation links with other authors is calculated and the authors

with the greatest total link strength are selected by the VOS viewer. In Figure 3 weight is given to the total link strength. The largest set of 51 items is shown in the figure. Seven clusters were shown in different colors. Kim Myung Ja in the red color cluster is the most cited author (516 times) with a total link strength of 55. But Yung, Ryan has the highest total link strength of 70 with 124 citations.

Figure 4 (Countries)

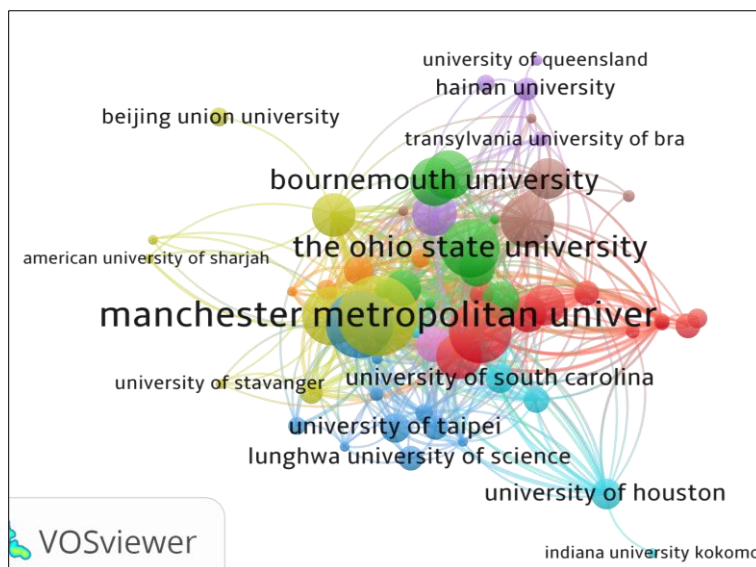


Source: Authors' Calculation using VOS viewer

To analyze the citation of countries the minimum number of documents of a country is given as 2 and minimum number of citations of a country is also given as 2 since virtual tourism is an emerging phenomenon. 40 countries among 61 meet the threshold. For each of the 40 countries, the total strength of citation links with other countries is calculated and the countries with the greatest total link strength are selected by the VOS

viewer. In Figure 3 weight is given to the total link strength. Eight clusters were shown in different colors. USA has the highest number of citations (1576 times) which is shown in the green color cluster with a total link strength of 350. China in the green cluster has the highest total link strength of 394 and has 1308 citations.

Figure 5 (Organizations)



Source: Authors' Calculation using VOS viewer

To analyze the citation of organization the minimum number of documents of an organization is given as 2 and minimum number of citations of an organization is also given as 2 since virtual tourism is an emerging phenomenon. 68 organizations among 335 meet the threshold. For each of the 68 organizations, the total strength of citation links with other organizations is calculated

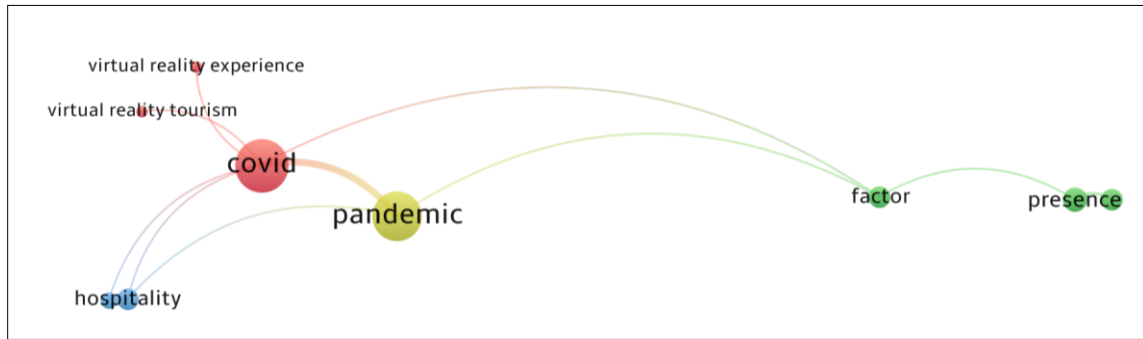
and the organizations with the greatest total link strength are selected by the VOS viewer. In Figure 5 weight is given to the total link strength. The largest set of connected 60 items is shown in the figure. Nine clusters were shown in different colors. Manchester Metropolitan University in the red cluster is the most cited organization (841 times) with a total link strength of 163.

Table 3: Bibliometric analysis of co-occurrence of text data

SL NO	TERM	OCCURRENCES	RELEVANCE
1	Tourism Marketing	5	2.99
2	Presence	9	2.29
3	Virtual Reality Experience	8	0.99
4	Virtual Reality Tourism	9	0.99
5	Covid	43	0.70
6	Pandemic	15	0.60
7	Systematic Review	5	0.59
8	Factor	5	0.40
9	Hospitality	9	0.36
10	Case Study	8	0.00

Source: Authors' Calculation using VOS viewer

Figure 6

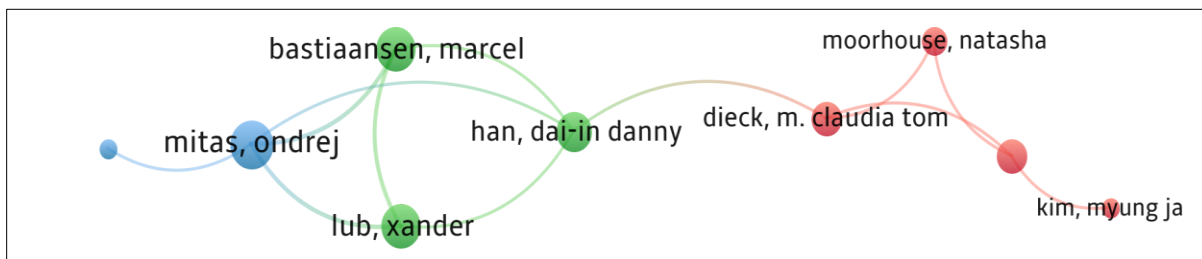


Source: Authors' Calculation using VOS viewer

The analysis of co-occurrence of text data is done with a view to obtain the most repeated keyword in virtual tourism related publications. Only the title field is selected for the extraction of terms. The minimum number of occurrences of a term is given as 5 times. 21 terms from the 902 terms meet the threshold. VOS viewer calculates a relevant score for each of the 21 terms and based on this score the most relevant terms will be selected. The

default choice is 60 percent of relevant terms and in this analysis 10 top most terms is selected. The largest set of connected 9 terms is shown in the figure with weight to the total link strength. The most repeated keyword is Covid (43 times). According to the relevance score the term Tourism Marketing is the relevant word with score 2.99. The top 10 terms in the order of their relevance score is shown in the Table 3.

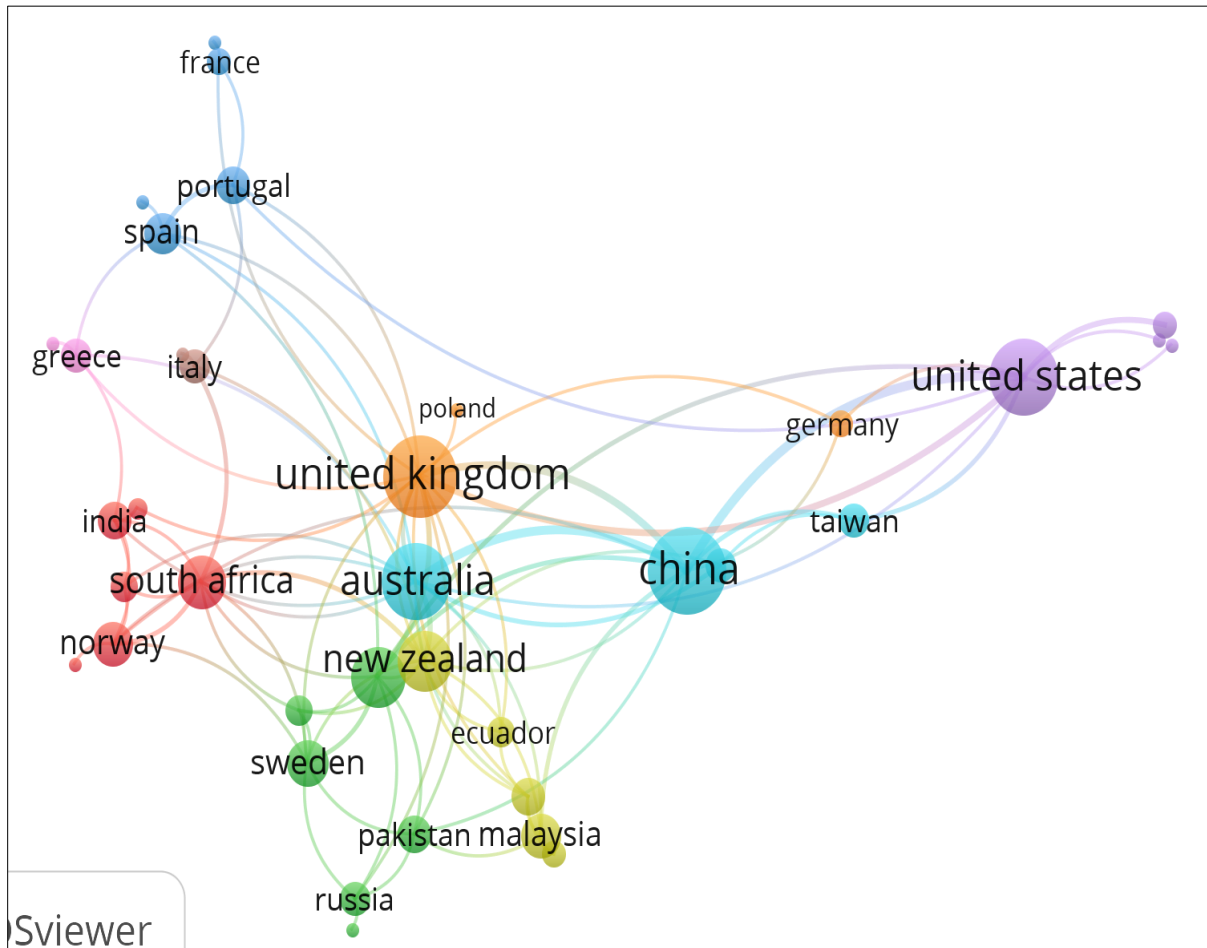
Figure 7: Bibliometric analysis of co-authorship



Source: Authors' Calculation using VOS viewer

To analyze the co-authorship of authors the minimum number of documents of an author is given as 2 and minimum number of citations of an author is also given as 2 since virtual tourism is an emerging phenomenon. 59 authors among 834 meet the threshold. For each of the 59 authors, the total strength of citation links of co-authorship links with other authors is calculated and the authors with the greatest total link strength are selected by the VOS viewer. In Figure 7 weight is given to the total link strength. The largest set of 9 items is shown in the figure. Three clusters were shown in different colors. This figure indicates the connection of authors who have collaborated in the field of virtual tourism research. It shows that *Ondrej Mitas, Utrecht University, Netherlands* in the blue color cluster has a higher link strength of 6 and he have collaborated with 4 authors.

Figure 8 (Countries)



Source: Authors' Calculation using VOS viewer

To analyze the co-authorship of countries the minimum number of documents of a country is given as 2 and minimum number of citations of a country is also given as 2 since virtual tourism is an emerging phenomenon. 40 countries among 61 meet the threshold. For each of the 40 countries, the total strength of co-authorship links with other countries is calculated and the

countries with the greatest total link strength are selected by the VOS viewer. In Figure 8 weight is given to the total link strength. Nine clusters were shown in different colors. The largest set of connected 37 items is shown in the figure. *China* has the highest total link strength of 31 times and has collaborated with 11 countries.

Figure 9: Bibliometric analysis of Co-Citations

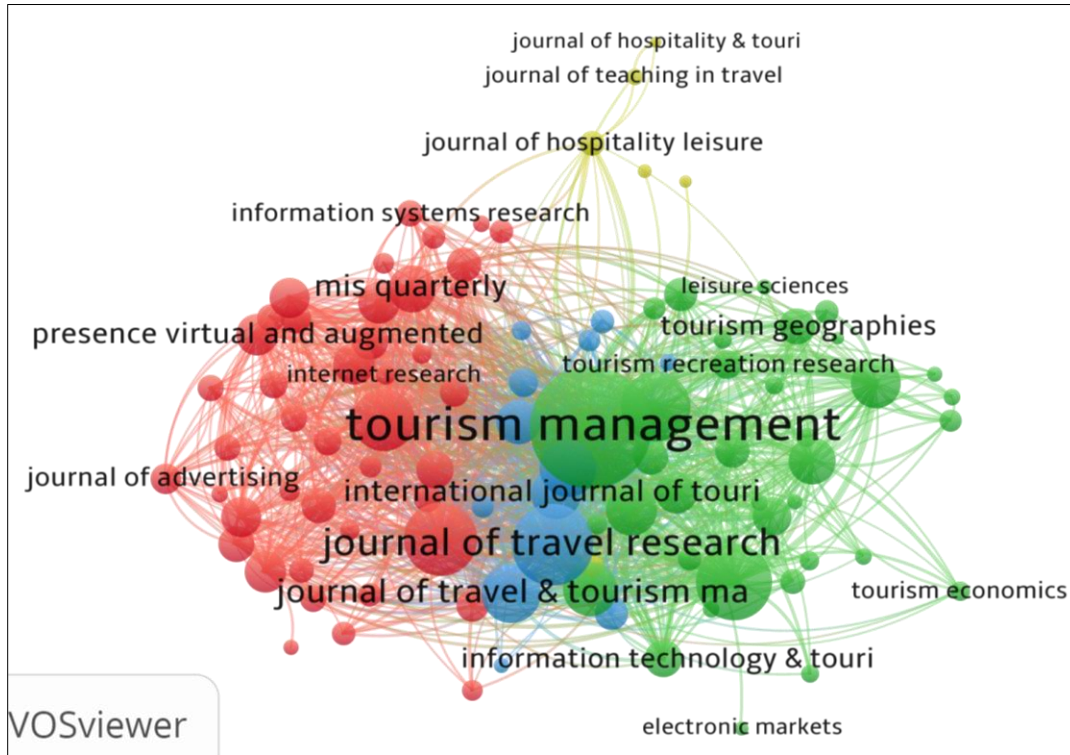
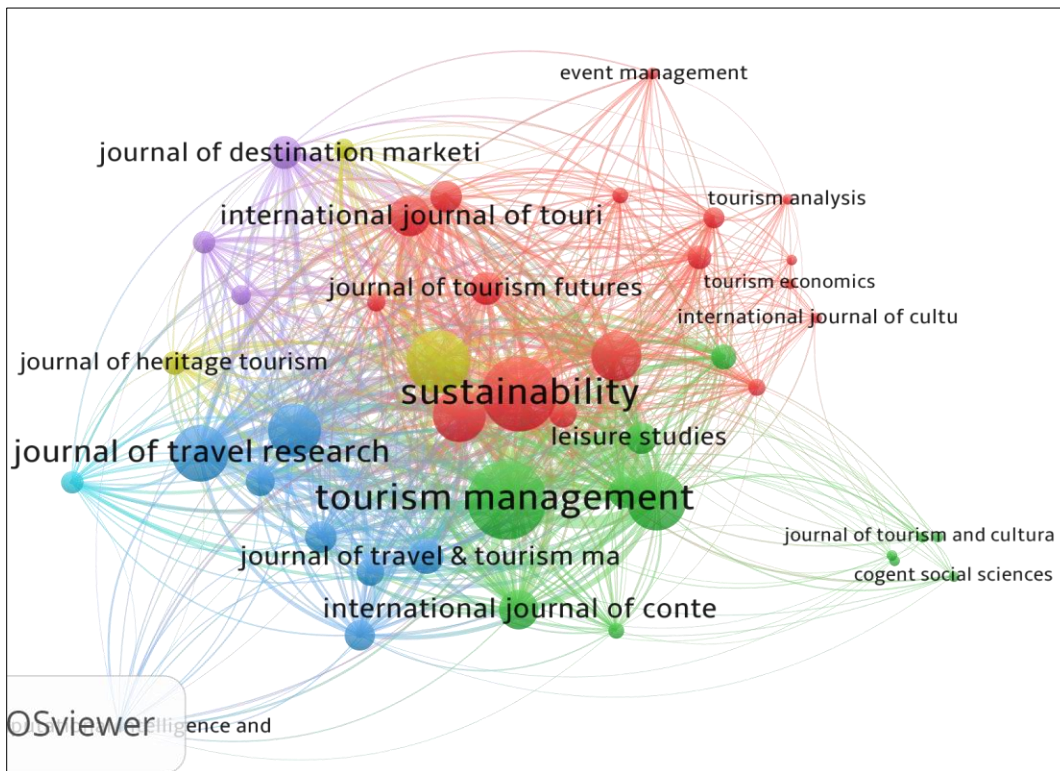


Figure 10: Bibliometric analysis of Bibliographic coupling (Sources)



Source: Authors' Calculation using VOS viewer

To analyze the co-citation of cited sources minimum number of citations of a source is limited to 20. 98 meet the threshold among 2458 sources. VOS viewer calculates the total link strength of co-citation with other sources and based on that source with greatest link is selected. In the figures weight is given to the total link strength.

To analyze the bibliographic coupling of sources the minimum number of documents of a source is given as 2 and minimum number of citations of a source is also given as 2 since virtual tourism is an emerging phenomenon. 48 sources among 106 meet the threshold. For each of the 48 sources, the total strength of bibliographic coupling links with other sources is calculated and the sources with the greatest total link strength are selected by the VOS viewer. In Figure 10 weight is given to the total link strength. The largest set of connected 44 items are shown in the figure. Six clusters were shown in different colors

Figure 9 and Figure 10 shows that *TOURISM MANAGEMENT* is the representative journal in the area of discussion as it has a higher link strength of 48620 in co-citation analysis and 5321 in bibliographic coupling also *SUSTAINABILITY* is the journal which has contributed a greater number of articles to the field of research.

6. DISCUSSION

In this section, the answers to the research questions of the article are discussed.

RQ1: *What is the annual trend of virtual tourism publications?*

Annual trend of virtual tourism publications is shown in Figure 1. It shows that the annual number of publications of virtual tourism papers exhibits an increasing trend. From 19 publications in 2018, there is a sharp increase to 103 publications in 2022 (within 5 years). Figure 2 shows that the research categories of commerce, management, tourism and services contribute a larger number of publications to this field.

RQ2: *Which author, organization and journal contributed more to virtual tourism-based research?*

Table 2 exhibits the top 10 sources of publications in the field of virtual tourism in terms of number of publications. The Figure 9 of co-citation and Figure 10 of bibliographic coupling of sources shows the sources the documents share in common. From three of the items, Table 1, Figure 9 and Figure 10 it is inferred that *Tourism Management* can be considered as the representative journal in the field of virtual tourism as it has more citations and the journal *Sustainability* has contributed a larger number of publications (37) to the field of virtual tourism.

Figure 3 exhibits the bibliometric analysis of citation of authors. It shows that Ryan Yung and Brent Don Moyle both from Griffith University, Australia has the highest number of publications in the area of virtual tourism (5 each). But in terms of number of citations Myung Ja Kim from Kyung Hee University, South Korea with 2 publications has the highest number of citations (516 times). And in terms of total link strength Ryan Yung with 70 holds the top rank.

Figure 5 exhibits the bibliometric analysis of citation of organizations. It shows that Griffith University (12) has highest number of publications in the field of virtual tourism. While, Hong Kong Polytechnic University (11) holds the second position. But in terms of citations and total link strength Manchester Metropolitan University comes upon top with 841 citations and a total link strength of 165.

RQ3: *Which are the leading countries in the publication of virtual tourism papers?*

Figure 5 shows the bibliometric analysis of citations of countries which indicates that in terms of number of publications and total link strength China, USA and UK holds the top first, second and third ranks respectively. In terms of count of citations, the position changed as USA, UK and China the top first, second and third rank respectively. The Figure 8 of bibliometric analysis of co-authorship indicates that China has the highest total link strength of 31 times and has collaborated with 11 countries.

RQ4: *What are the popular keywords in the publication of virtual tourism papers?*

The most repeated keyword is *Covid* (43 times). The term *Tourism Marketing* is the relevant word with score 2.99.

THEORETICAL IMPLICATIONS

The paper aims at examining the developments in the field of virtual tourism in the last five years (2018-2022) and it is evident that virtual tourism is an emerging phenomenon, has wider scope for research. The results obtained from the bibliometric analysis of virtual tourism will have some important implications for future researchers by giving them a new direction for their investigations in the respective area of research.

7. LIMITATIONS

The findings of the paper can be interpreted within the context of certain limits as it is not an exhaustive study, the study analyses the data extracted from the dimensions database only. Also, certain criteria have been employed for search and analysis i.e., the study only includes articles between 2018-2022 in the research area of commerce, management, tourism and service. This may limit the quality of results.

8. CONCLUSION

In this paper, a bibliometric analysis of virtual tourism is presented. 299 papers which confirms the selection criteria were retrieved from the Dimensions database covering the 2018 to 2022-time span. It is inferred from the analysis that the enthusiasm of researchers in virtual tourism is at an increasing trend. The top research area associated with virtual tourism includes commerce, management, tourism and service. Ryan Yung and Brent Don Moyle both from Griffith University, Australia, Myung Ja Kim from Kyung Hee University, South Korea are the popular researchers in the field. Sustainability and Tourism Management are the top journals. Griffith University, Hong Kong Polytechnic University and Manchester Metropolitan University are most contributory

organizations. China, USA and UK are the top most contributory countries in the publications of virtual tourism papers. The most repeated keyword is *Covid*. *Tourism Marketing* is the most relevant keywords. The analysis shows that virtual tourism is an attractive area of research which has much possibilities of both exploratory cum applied researches. The researchers definitely have wide scope for further research in the field of virtual tourism

9. COMPETING INTERESTS

The authors declare no competing interests. Umamaheswari R and Dr. Mohanadasan T are affiliated with the Department of Commerce Studies and Research, Victoria Palakkad Government College, Calicut University, Kerala, India. Their respective roles as university Research Scholar and Associate professor neither influenced the research findings nor the content presented in this bibliometric analysis of virtual tourism. The research was conducted independently, without any financial or personal interest that could inappropriately influence the results or interpretation of this research.

REFERENCES

1. Choi K, Ahn Y. Augmented reality applications in cultural heritage tourism. *J Cult Herit.* 2020;43:183-90.
2. Cobo MJ, Herrera F, Herrera-Viedma E, Martinez MA. Trends in VR research across various fields. *J Informetr.* 2019;13(3):725-46.
3. Gössling S, Scott D, Hall CM. Pandemics and tourism: COVID-19 impacts. *Ann Tour Res.* 2020;83:102961.
4. Guttentag D. Virtual reality: Applications and implications for tourism. *Tour Manag.* 2018;66:127-36.
5. Hall CM. An introduction to bibliometric methods. *Tour Manag.* 2018;66:127-36.
6. Han J, Kang HJ, Kim M, Kwon GH. Mapping the intellectual structure of research on surgery with mixed reality: Bibliometric network analysis (2000–2019). *J Biomed Inform.* 2020;109:103516.
7. Huang Y, Li X, Kim MJ. Educational benefits of virtual tourism. *Educ Technol Res Dev.* 2022;70(2):399-420.
8. Jiang J, Gao W, Zheng Y. Bibliometric analysis of sustainable tourism. *Sustainability.* 2020;12(8):3321.
9. Kim MJ, Kim J, Kim J. Behavioral economics in virtual tourism. *J Travel Res.* 2019;58(5):760-74.
10. Koo C, Shin S, Gretzel U, Hunter WC. Sustainability aspects of virtual tourism. *Sustainability.* 2021;13(9):5101.
11. Li X, Chen W. Economic impact of virtual tourism. *Tour Econ.* 2022;28(2):310-28.
12. Ritchie JR, Hudson S. Ethics of virtual tourism. *J Bus Ethics.* 2022;178:833-48.
13. Sigala M. Tourism and COVID-19: Impacts and implications. *Ann Tour Res.* 2020;83:102913.
14. Sidhu AK, Singh H, Virdi SS, Kumar R. A bibliometric analysis on job stress using visualizing network. [No journal name provided; this citation may need further details].
15. Stainton H. What is Virtual Tourism and is it the Future? – Tourism Teacher. *Tourism Teacher.* 2023 Feb 19. Available from: <https://tourismteacher.com/virtual-tourism/>
16. Van Eck NJ, Waltman L. Software survey: VOSviewer, a computer program for bibliometric mapping. *Scientometrics.* 2010;84(2):523-38.
17. Why did we build Dimensions | Dimensions. Dimensions. Available from: <https://www.dimensions.ai/why-dimensions/>
18. Yu Y, Li Y, Zhang Z, Gu Z, Zhong H, Zha Q, *et al.*, A bibliometric analysis using VOSviewer of publications on COVID-19. *Ann Transl Med.* 2020;8(13).
19. Zong H, Zhang Y. Mapping the intellectual structure of tourism research. *J Travel Res.* 2019;58(8):1110-27.

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