The Rise of Virtual Tour in Tourism: A Bibliometric Review and Future Research Agenda

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Abstract
This study aims to identify the most prominent authors, journals, the most productive and cited countries, the most productive affiliations, and the most commonly used keywords in the field. Second, to identify and present the existing gaps in the literature and sets out the future research trajectory. The present study identified and extracted the bibliographic data from the Scopus database and employs bibliometric analysis by using the Bibliometrix R-package tool. All relevant publications on virtual tours in tourism from 2002 to 2022 are reviewed in this study. A variety of perspectives on virtual tours in tourism were explored and discussed. The findings from the bibliometric analysis provide a holistic understanding of the structure of the field under investigation. The leading trends in terms of authors, journals, countries, affiliations, and keywords were also included. This study draws whole new insights and trends in the integration of virtual tours in tourism as part of an effort for the industry to embrace the perks of technologies, especially post-COVID. By mapping what is known, the study also provides a high potential to help industrial practitioners, especially hoteliers to get a better picture of how technology can empower tourists' desire for the tourism sites. The study will contribute critically to ascertaining relevant research aspects on a virtual tour in tourism. Additionally, the analysis and the graphical visualization are equally crucial, as they will benefit both researchers and practitioner, to better understand the state-of-the-art of virtual tour in tourism, synthesizes existing knowledge, and offers scientific evidence of potential research gaps as well as reveal possibilities, directions, and paths for future study in this growing discipline of tourism studies.
Keywords: Bibliometric Analysis, Virtual Tour, Tourism, R, Bibliometrix

Introduction

COVID-19 has brought the world to a halt. To mitigate the spread of COVID-19, several measures have been implemented by most governments all over the whole, including border closure, community lockdowns, closure of public areas, and suspension of flights. All of these measures have obviously and significantly affected the travel and tourism industry (Sharma & Nicolau, 2020). Different economic sectors responded to the crisis in different ways. Due to the nature of the travel and tourism industry, which typically requires one's physical presence

(Itani & Hollebeek, 2021), and is heavily dependent on visitor desires for novelty and direct experiences (Su et al., 2020), it will be interesting to see how these sectors will react and recover from the crisis. Though these sectors are often associated with the non-necessity zone, however, it is also among the sector that contributes significantly to the economy of many communities (El-Said & Aziz, 2022).

Like other crises, the COVID-19 have dramatically shifted our use and reliance on digital technology (Gkeredakis et al., 2021), for instance, the use of virtual reality applications, robotic applications, technologies related to mobility tracking, self-service kiosk, and digital identity control in airport, and virtual tours (Sigala, 2020). Therefore, in response to the COVID-19 pandemic, there is an urge to reform the travel and tourism industry to be more sustainable (Ioannides & Gyimóthy, 2020). In addition, there is also a call to develop cutting-edge, digitalized tourism experiences (UNWTO, 2020).

During the pandemic, the interest to use virtual technologies in tourism has risen because it is viewed as a less risky, more rational, and cost-effective substitute for traditional travel (Merkx & Nawijn, 2021; Schiopu et al., 2021). Tourism sites, ranging from museums to zoos to theme parks, utilize a variety of methods to communicate with the visitors, such as 360 videos, mixed reality experiences, and virtual tour spaces (Godovykh et al., 2022). Virtual tourism not only provides safe and accessible options to keep people engaged with a particular tourism destination, but it may also aid in tourism recovery post-pandemic (El-Said & Aziz, 2022; Rahim et al., 2021). Furthermore, well-known hotel chains such as Hilton, Marriot Thomas Cook, and Best Western have begun leveraging virtual reality technology as it provides a completely new form of product visualization that has the potential to significantly alter the hotel presentation (Israel et al., 2019).

With the increasing popularity and interest in virtual reality and augmented reality, there has been growing literature, particularly in the bibliometric studies, that associates these technologies with the tourism research (Yung & Khoo-Lattimore, 2017), tourism design (Agapito, 2020), mobile technology in tourism (Chen et al., 2020; Dorcic et al., 2018), e-tourism (Singh & Bashar, 2021), and in the educational context (Campos Soto et al., 2020). However, the application of digital technology in crisis management is still poorly understood (Gkeredakis et al., 2021). In addition, studies that explore these technologies in tourism marketing, specifically in the area of tourists' experiences remain scarce (Tavakoli & Mura, 2015). Moreover, studies exploring the role of virtual tours, as to whether it is regarded as interim products during the crisis or a marketing tools after the wake of pandemic, still remains scant (El-Said & Aziz, 2022).

To bridge the gap and urgency, the objective of this study is twofold
  1) Identify the most prominent authors and journals, the most productive and cited countries, the most productive affiliations, and the most commonly used keywords in the field.
  2) Identify and present the existing gaps in the literature and sets out the future research trajectory.

Such studies should yield useful insights for tourism product and destination managers looking to capitalize on this trend by providing more meaningful tourist experiences. For

attaining this objective, bibliometric analysis is proposed to systematically review the past studies.

Literature Review
A virtual tour can be described as "a simulation of an existing location that is composed of a sequence of video images''(Osman et al., 2009). A virtual tour is a representation of a real scenic spot and destination virtually (Kim & Ko, 2019), it aims to serve as a precursor to a visit or as an extension of consumers' previous experience (Kim & Hall, 2019). The simulation is comprised of a series of videos or images that are accompanied by text descriptions, audio guides, or sound effects (El-Said & Aziz, 2022). It not only offers consumers a "try-before-you-buy" experience (Ying et al., 2021) but also allows prospective guests to gather useful information that will aid in their hotel selection process (Israel et al., 2019).

The simulated experiences are set up with the intention to recreate the real site experiences authentically (Spielmann & Mantonakis, 2018). It allows users to move freely at any angle and steer the video by selecting any direction that they wish to view (Wu & Lai, 2022). Virtual tours were more commonly experienced through websites by using a computer, where users can see and interact with a simulated landscape via a monitor and a mouse, respectively (El-Said & Aziz, 2022). In addition, the virtual tours can also be experienced through advanced technologies such as virtual reality (VR) via VR headset (Barbieri et al., 2017; Flavián et al., 2020), which stimulates the user's interest and consequently influences their behavioral intention (Flavián et al., 2020).

In 2020, the global virtual tour market was estimated to be worth $448.10 million, and it is expected to reach $6.5 billion by 2030, growing at a CAGR of 31% between 2021 and 2030 (Allied Market Research, 2022). Nowadays, a virtual tour has grown popular among attraction managers, because it typically requires only little financial investment, provides visitors with a variety of tools to assist in learning, and enables attractions' intangible and tangible qualities to be communicated (El-Said & Aziz, 2022). Thus, it is not surprising for virtual tours to be adopted by several world-class museums to allow their visitors to experience their collections from just about any location in the world. For example, to celebrate Leonardo da Vinci's 500th anniversary of death, the Louvre Museum in partnership with HTC VIVE Arts presented its first virtual reality experience, which provides the visitor an opportunity to immerse and interact with the painting of Mona Lisa in virtual environment (Lourve, 2019).

While in Malaysia, some industry players are already integrating virtual technologies into their businesses, such as through live virtual excursions with real tour guides and recorded segments for destinations such as Melaka and Kuala Lumpur (Goh, 2020). Besides, there are also some licensed tours that offer virtual experiences by exploring the city of Kuala Lumpur on foot (Klonfoot.com, 2020). Furthermore, with the virtual technologies available today, it is also not surprising to see a virtual safari experience, which is offered by the Bornean Sun Bear Conservation Centre in Sandakan, Sabah (Goh, 2020).

Although study on the innovations in tourism has been gaining momentum, there has been a recent urge for more substantive study. Despite the growing interest and discussion in virtual tours in tourism, we still do not systematically explore yet, the knowledge that has been built from academic papers on this field and if and how research in virtual tours coincides, and the

emerging context in which virtual tours have appeared in tourism research (Singh & Bashar, 2021). In light of these gaps, the main purpose of this study is to conduct a review of virtual tour research in tourism. By mapping what is known, this study has provided the framework for future research by identifying gaps and possibilities. The review's findings will also help to create a complete picture of the rising benefits and challenges of virtual tour application in tourism, revealing possibilities and directions for future study in this growing discipline of tourism studies.

Materials and Methods

This study utilizes bibliometric methods to analyze the existing literature related to virtual tours and tourism. The bibliometric analysis employs fundamental to advanced mathematical and statistical approaches to review and evaluate the scientific contribution and effect of publications in research of interest (Rodríguez-López et al., 2020). It summarises a field's bibliometric and intellectual structure by examining the social and structural relationships between various research parts (e.g., authors, countries, institutions, topics) (Donthu et al., 2021). The bibliometric analysis involves the retrieval of documents from a variety of bibliographical databases, including Web of Science (WoS), Scopus, and Google Scholar. Following that, identified documents are evaluated using different bibliometric methodologies and graphical representations to comprehend the evolution of a domain's intellectual and conceptual structure, such as co-citation, co-word, and co-authorship analysis. To assess the research impact of published literature, bibliometric indicators such as citation counts by publication, author, and/or institution are utilized (Donthu et al., 2021; Utkarsh & Sigala, 2021).

A Preferred Reporting Items for Systematic Review and Meta-Analysis (PRISMA) protocol (Page et al., 2021) was employed to plan and conduct a systematic review to ensure that all recommended information is captured. Figure 1 illustrated the process and procedure involved. In this study, the data were retrieved and extracted from the Scopus database for bibliometric analysis. Scopus is chosen, as it is one of the world's largest curated abstract and citation databases, with global and regional coverage of scientific journals, conference proceedings, and books, while ensuring only the highest quality data is indexed through rigorous content selection and re-evaluation by an independent Content Selection and Advisory Board (Baas et al., 2020). Furthermore, the Scopus database is also known as one of the key sources of related information by the international scientific community.

In the first step, the study conducted a search for a specific topic or field, using the Scopus database. The search terms "virtual tour*" OR "virtual trip*" AND "tourism*" OR "travel*" OR "vacation*" OR "holiday*" OR "excursion*" were included. Based on these search terms, a total of 403 articles were generated. In the second step, the 403 articles were further screened according to certain criteria, including (1) publication year, (2) document type, and (3) language, which generated a total of 154 articles. In this study, the inclusion of data includes research papers published over the last 20 years, from 2002 to 2022 time frame, and written in English. This study also excluded 11 articles that were reviewed and deemed to be unrelated to the study's topic. Finally, following the aforementioned approach, a total of 143 articles were included for further analysis.
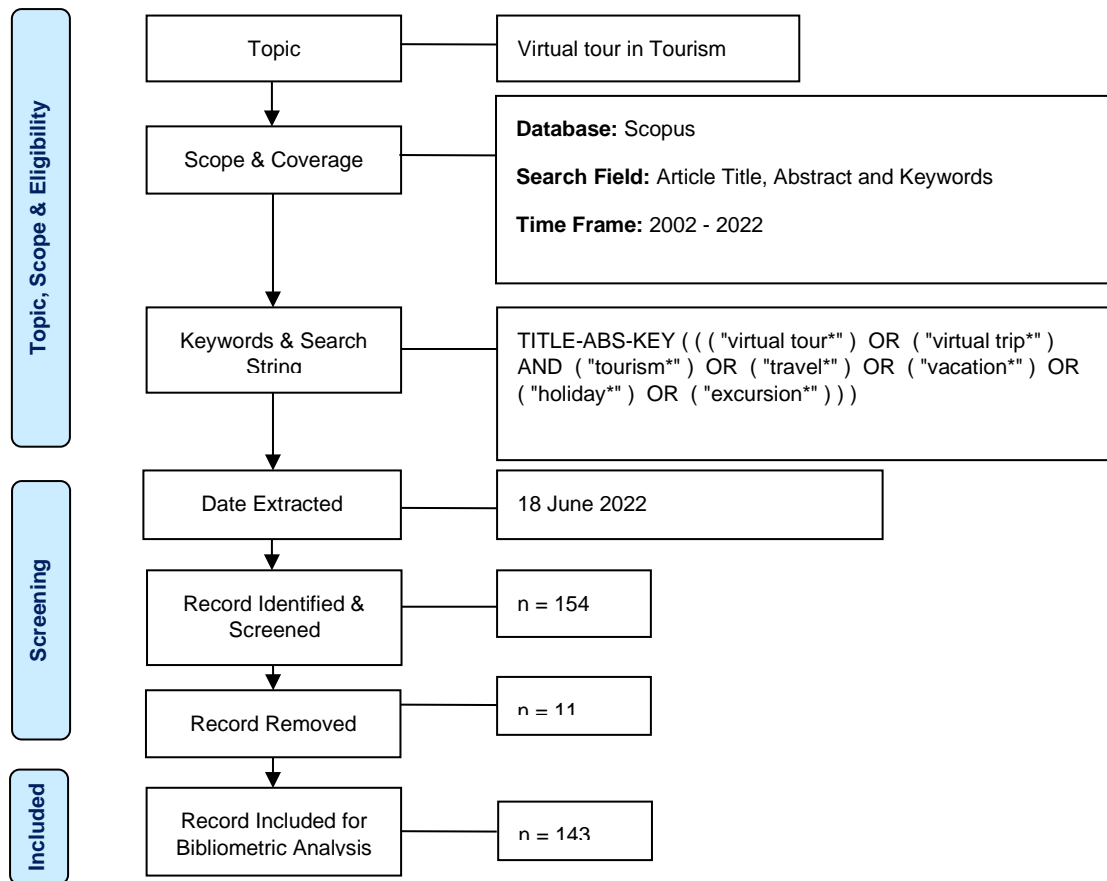
Topic, Scope & Eligibility

Topic ——— Virtual tour in Tourism

Scope & Coverage ———
Database: Scopus

Search Field: Article Title, Abstract and Keywords

Time Frame: 2002 - 2022

Keywords & Search String ———
TITLE-ABS-KEY ((("virtual tour*") OR ("virtual trip*") AND ("tourism*") OR ("travel*") OR ("vacation*") OR ("holiday*") OR ("excursion*")))

Date Extracted ——— 18 June 2022

Screening

Record Identified & Screened ——— n = 154

Record Removed ——— n = 11

Included

Record Included for Bibliometric Analysis ——— n = 143

Figure 1. Flow diagram of the search strategy (Page et al., 2021)

Analysis and Results
Descriptive Analysis
This current study reviewed research articles in the field of virtual tours in tourism that were published from 2002 to 2022. The review involved a total of 143 documents that were published in 112 publications over the last 20 years, written by 446 authors, and there are at least 25 single-authored documents.

Main Information
Table 1 depicted the overall insights and overview of the dataset related to virtual tours and tourism over 20 years time span from 2002 to 2022. Besides the main information about the data, Table 1 also summarized the contents of the documents, information about the authors and the author's collaboration, and the document types.

Table 1
Main information regarding selected articles.

Description	Results
MAIN INFORMATION ABOUT DATA	
Timespan	2002:2022
Sources (Journals, Books, etc)	112
Documents	143
Annual Growth Rate %	13.9
Document Average Age	4.48
Average citations per doc	13.72
References	6854
DOCUMENT CONTENTS	
Keywords Plus (ID)	569
Author's Keywords (DE)	550
AUTHORS	
Authors	446
Authors of single-authored docs	25
AUTHORS COLLABORATION	
Single-authored docs	25
Co-Authors per Doc	3.29
International co-authorships %	23.78
DOCUMENT TYPES	
article	143

Annual Publication Trends

Figure 2 depicted the annual publication trend and it is observed that the number of publications is growing by 13.9% every year. There has been positive growth in the publication from 2018, 2019, and 2021, each with 5, 7, 9, and 34 published articles respectively. Meanwhile, a total of 27 articles were published in 2022 to date. It is expected that the number of publications on virtual tours in tourism will continue to rise considering the positive overall trend over the years.
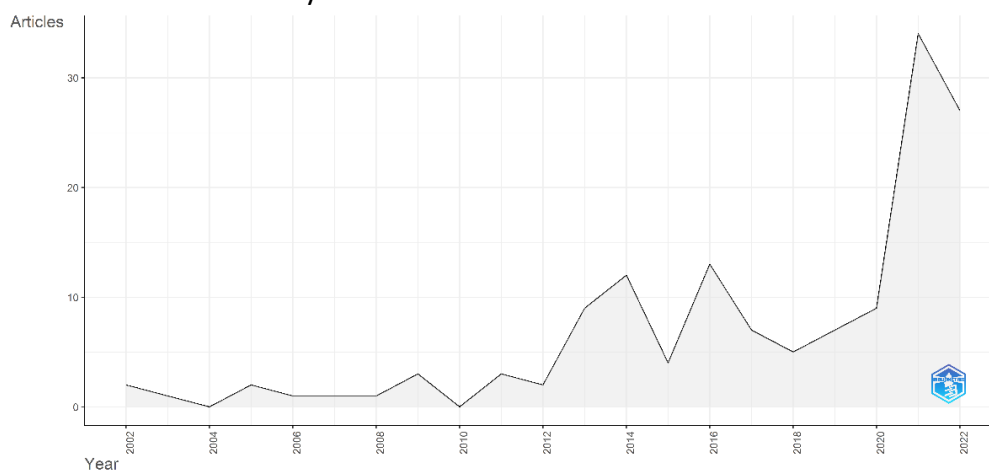

Figure 2. Annual publication trends

Most Influential Authors

The number of citations of a paper has become a useful indication for evaluating the efforts made by the authors as a measure of its impact on a specific topic (Garfield, 2006). Table 2 shows the top 20 of the most influential authors based on the total citations that they received. Wang Y received the highest citations as compared to other authors. From the perspective of the h-index, Wang Y is also among the highest, with a 3 h-index. The h-index measures the impact of publications based on the author's most cited papers and the number of citations they have received in other people's publications (Hirsch & Buela-Casal, 2014). Wang Y also recorded the highest g-index (3), which means that the top three of their articles combined have received at least 9 (3^2) total citations.

Table 2
Top 20 most influential authors

No.	Author	h_index	g_index	m_index	TC	NP	PY_start
1	Wang Y	3	3	0.143	417	3	2002
2	Fesenmaier DR	2	2	0.095	411	2	2002
3	Backman KF	2	2	0.2	341	2	2013
4	Backman SJ	2	2	0.2	341	2	2013
5	Yu Q	1	1	0.048	309	1	2002
6	Chang Ll	1	1	0.143	203	1	2016
7	Huang YC	1	1	0.143	203	1	2016
8	Li XR	1	1	0.143	156	1	2016
9	Wang X	1	1	0.143	156	1	2016
10	Zhang J	1	1	0.143	156	1	2016
11	Zhen F	1	1	0.143	156	1	2016
12	Huang Y-C	1	1	0.1	138	1	2013
13	Moore D	1	1	0.1	138	1	2013
14	Cho Y-H	1	1	0.048	102	1	2002
15	Goy Jl	2	2	0.2	78	2	2013
16	Martínez-Graña AM	2	2	0.2	78	2	2013
17	Cai R	1	1	0.083	78	1	2011
18	Hao Q	1	1	0.083	78	1	2011
19	Hu T	1	1	0.083	78	1	2011
20	Pang Y	1	1	0.083	78	1	2011

Most Influential Journal

Table 3 shows the top 20 most of the highly influential journals based on total citations. This analysis views the perspective of the performance and impact of the journals, and it measures whether the published articles within the journal contributed to the field of study. Though, some journals may publish fewer articles than others, however, in terms of impact, these journals were highly influential in the domain of the subject under investigation. For instance, Tourism Management has four impactful articles related to virtual tours in tourism. But in terms of impact, this journal had the most citations (611) compared to the other journals.

Table 3
Top 20 most the influential journals based on total citations

No	Source	h_index	g_index	m_index	TC	NP	PY_start
1	Tourism Management	4	4	0.19	611	4	2002
2	International Journal of Tourism Research	1	1	0.143	203	1	2016
3	Journal of Travel and Tourism Marketing	1	1	0.048	102	1	2002
4	Computer Vision and Image Understanding	1	1	0.083	78	1	2011
5	Journal of Vacation Marketing	1	1	0.071	61	1	2009
6	Computers And Geosciences	1	1	0.1	55	1	2013
7	Journal of Hospitality, Leisure, Sport and Tourism Education	1	1	0.2	55	1	2018
8	Sustainability (Switzerland)	2	5	0.5	44	5	2019
9	Information Technology and Tourism	2	2	0.333	42	2	2017
10	Journal of Travel Research	2	2	0.286	40	2	2016
11	Journal of Sustainable Tourism	1	1	0.1	40	1	2013
12	Remote Sensing	2	2	0.667	32	2	2020
13	Journal of Cultural Heritage	1	1	0.071	32	1	2009
14	Journal of Urban Technology	1	1	0.111	31	1	2014
15	Computers and Graphics (Pergamon)	1	1	0.083	29	1	2011
16	Tourist Studies	1	1	0.059	28	1	2006
17	Communication Research Reports	1	1	0.2	27	1	2018
18	International Journal of Technology Management	1	1	0.111	27	1	2014
19	Slavic Review	1	1	0.05	25	1	2003
20	Mediterranean Archaeology and Archaeometry	2	2	0.222	24	2	2014

Country-specific Production
Figure 3 illustrated the perspective of the corresponding author's country, under country-specific production. Darker color indicates a higher number of publications produced by the particular country. As observed in Figure 3, China, Italy, and Spain are the top 3 countries that published the highest number of documents related to virtual tours in tourism.
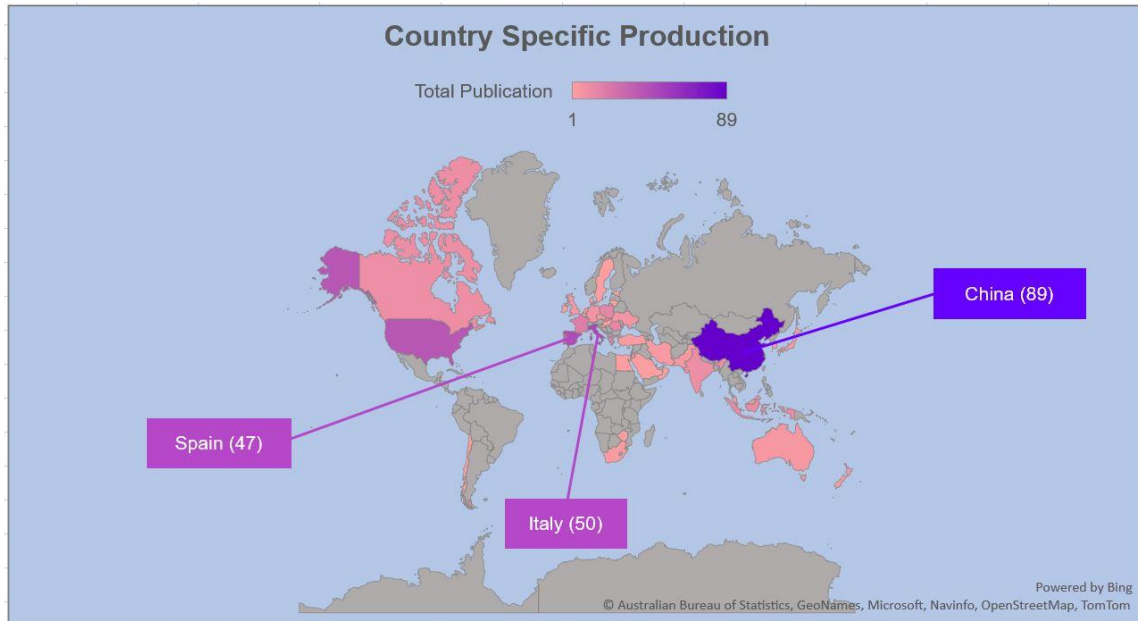
Figure 3. Country specific production

Most Cited Countries

As observed, Figure 4 illustrated the most cited countries based on total citations, while Figure 5 illustrated the most cited countries based on average articles per year. Based on the illustration, China leads the ranking with the highest citations, followed by the USA, Spain, Italy, and Korea. Besides leading the rank with the highest number of publications, China also produced the highest impact based on the number of citations and outperformed other countries.
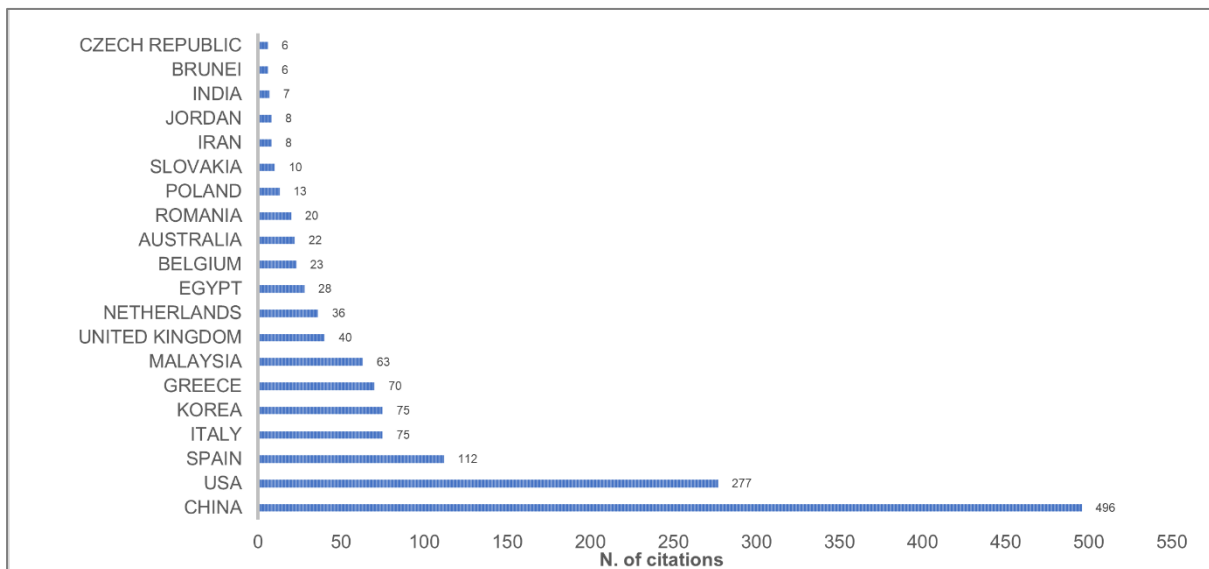

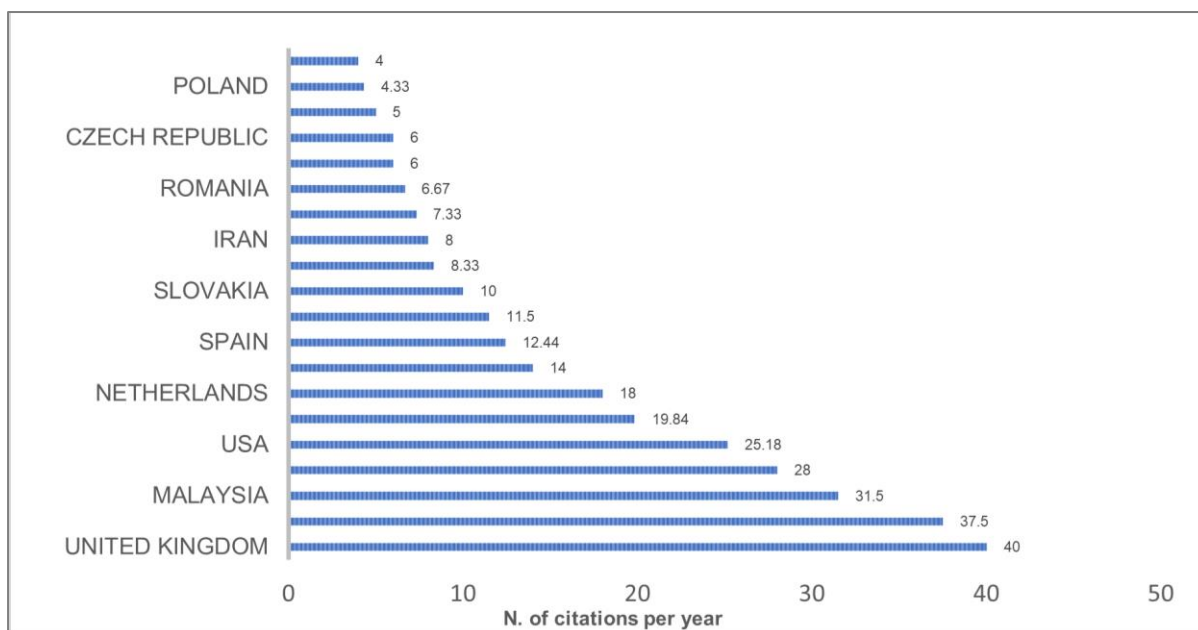Figure 4. Most cited countries (based on total citations)

Figure 5. Most cited countries (based on average citations per year)

Most Productive Affiliations

Most relevant affiliation refers to the productivity of publications based on the institutions which the authors have stated in the publication the organization that they are affiliated with. Figure 6 shows the most relevant affiliation in the field of virtual tours in tourism. Based on this figure, the University of Aveiro produced the highest number of publications with 13 publications in the virtual tour field of study, followed by the University of Salamanca with 8 publications and Ryerson University with 7 publications.
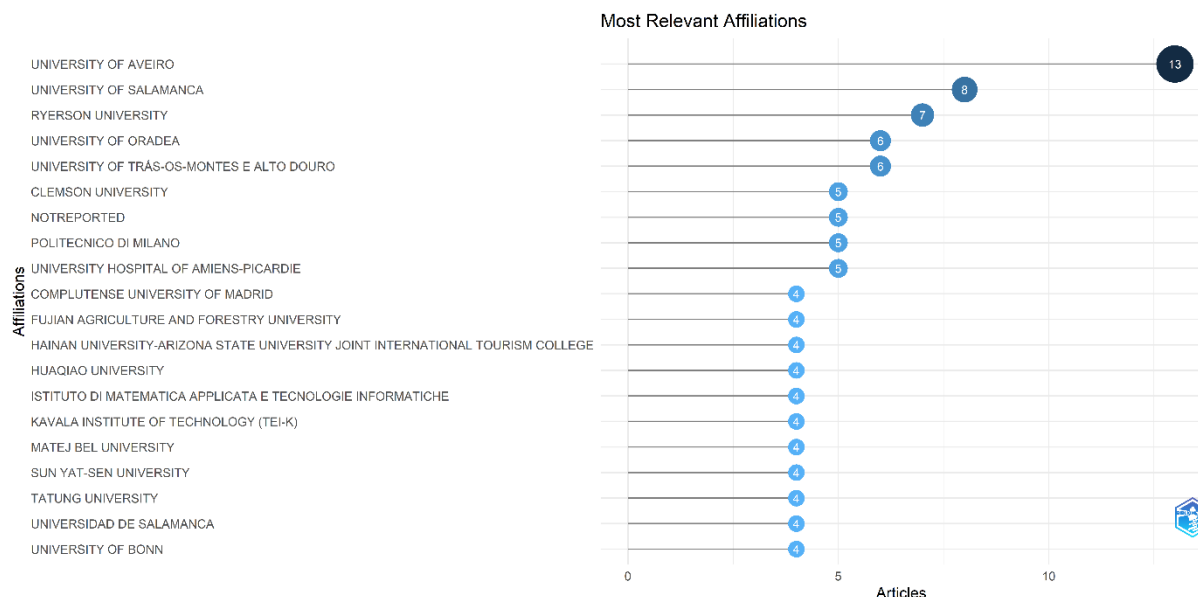

Figure 6. Most relevant affiliations

Most frequent keywords and trending topics

Figure 7.1 and Figure 7.2 shows the word cloud from the perspective of the author's keywords from two different cut-off periods. The frequency is generated using Keyword Plus as a parameter. As observed from both figures, it is clearly depicted that different focus of studies

for the period of 2002 to 2012 as compared to 2012 to 2022 in the virtual tour research domain. Before 2012, the focus of virtual tour research centered around the internet, knowledge management, and the virtual tour itself. However, after 2012, the focus of virtual tour research has evolved mainly on virtual reality, tourism, tourist destination, and COVID-19.

Figure 7.1. Word cloud of the author's keyword from 2002 – 2012

Figure 7.2. Word cloud of the author's keyword from 2012 – 2022

Figure 8 shows the trending topic of the author's keywords from 2002 to 2022 in virtual tour research. The top three terms that are popular among academics are "virtual reality" in 2020, "tourism" and "tourist destination" in 2021. Specifically, in 2020, the keyword trend is more focused on "virtual reality", "augmented reality" and "cultural heritages", while in 2021, the keyword trend focuses on "tourism" and "tourist destination". In 2022, the keyword trend focuses more on "COVID-19" and "tourism development".
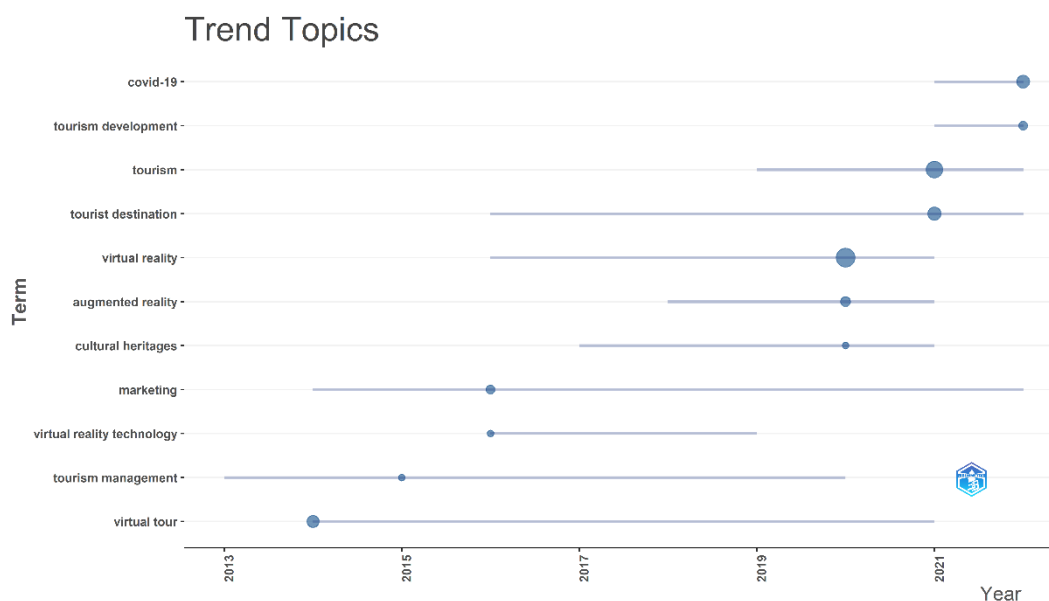
Figure 8. Trend topics of the author's keywords from 2002 – 2022 in virtual tour research

Discussion

The bibliometric analysis related to the use of virtual tours in tourism clearly shows the significant numbers of publications in the area and receives heighten attention resulting in an increased demand for future research in the tourism area. Over the last two decades, it is observed that the number of publications is growing annually by 13.9%. This is aligned with the shifting demand and dependability towards the technological advancement, in which the digital technologies such as augmented reality and virtual reality have grown prominence (Ye et al., 2020) and become an enabler that has contributed to the establishment of meaningful content based on user experiences, realistic and compelling interaction among virtual and physical environment, and the distinct value that goes above and beyond what other technologies offer (Shen et al., 2022; Ye et al., 2020).

Besides, the global virtual tour market is expanding and growing at a positive rate (Allied Market Research, 2022). This trend is further speeded up by the constant development of new virtual reality approaches by the global technology companies such as Microsoft, Google, and Facebook (Israel et al., 2019). In addition, the facets of VR and VR has already begun to be embraced by the tourism industry, especially among major hotel chain (Israel et al., 2019). Therefore, increased research trends are anticipated.

In identifying the most influential authors, the study revealed that Wang Y, Fesenmaier D.R., Backman K.F., and Backman S.J. are among the authors with the highest citations of papers and the number of citations that they received in other people's publications. Thus, academics who wish to conduct research in the field of virtual tours and tourism may look up to the publications of these authors as a source of reference.

Moreover, the study revealed that Tourism Management, the International Journal of Tourism Research, and the Journal of Travel and Tourism Marketing were among the top three influential journals. This implies that in addition to research in virtual tours and tourism, the journal that obtained the highest number of citations was similar in scope of travel and tourism. For instance, Tourism Management focuses on planning and policy of travel and

tourism, while the International Journal of Tourism Research aims to promote and enhance research developments in the field of tourism. Likewise, the Journal of Travel and Tourism Marketing seeks to be a medium for academics and practitioners in the field of travel and tourism where they can exchange ideas and stay up to date on the latest development in the tourism field.

Additionally, the study also revealed that China, Italy, and Spain are among the most productive countries that published the highest number of documents related to virtual tours in tourism. Similarly, the most-cited country goes to China which leads the ranking with the highest citations, followed by the USA, Spain, Italy, and Korea. Likewise, China also leads the ranking for countries that produces the highest impact based on the number of citation. This is in line with the present landscape of the country, where in a relatively short span of time, China has transformed itself from a technological backwater to one of the world's largest digital economies (Bu et al., 2021). They are also among the fast-growing country and the world's most important VR market (Virsabi, 2022). The main reason behind this is that the mainlanders are extremely enthusiastic early adopters of emerging technologies (Virsabi, 2022).

In addition, pertaining to the most productive affiliations, the University of Aveiro, and the University of Salamanca dan Ryerson University are among the most productive affiliations. This may imply that these institutions put on more of their research interest and concentration into the field of virtual tours and tourism. Hence, other research scholars and global institutions may leverage this opportunity to contribute works, particularly in these research fields, to develop links among institutions worldwide.

Furthermore, the study also provides visualization of the most frequently used keywords which are derived from the Keyword Plus. It is revealed that there are differences in terms of the research focus over the last two decades' time span (i.e., 2002 to 2012, and 2012 to 2022). Prior to 2012, the research focus is more on the internet, knowledge management, and virtual tour. Meanwhile, after 2012, the research focus has evolved into virtual reality, tourism, tourist destination, and COVID-19. This may be contributed by the advances in digital innovations that have been further accelerated by the COVID-19, which offered a new lever to the travel and tourism sector (Sharma et al., 2021). In addition, the COVID-19 pandemic could also contribute to the transverse shift in consumer behavior (Yadav et al., 2021), which lead to changes in consumers' mindsets and attitudes toward travel and tourism (Zenker & Kock, 2020) and preferences over virtual tours, instead of physical visitation.

Finally, in identifying the research trends, the study revealed that the terms "virtual reality" was trending in 2020, while the term "tourism" and "tourist destination" were trending in 2021. On the same note, the term "COVID-19" and "tourist development" seems to be trending in the 2022. This indicates that the trending keywords are indeed evolved over the years. This is in line with the development of virtual reality which has significantly progressed and is now being used in a variety of ways, from delivering immersive gaming experiences, to teaching a new skill and assisting people in a virtual trip.

Therefore, instead of exploring topics or themes that are already highly developed and saturated, which might provide limited or no contributions, it would be more beneficial if

researchers could discover and provide insight into topics that have yet to be explored and contribute to the body of knowledge. We suggest that researchers working on research related to the virtual tours and tourism, examine the application of virtual tours in capturing cultural landscape, to further explore the symbiosis between human activity and environment, as well as the application of virtual tours in the archaeological site, to further assess user's experiences via the VR technology to overcome the boundaries of reality, time, or space.

Conclusion

In this paper, we utilized a bibliometric approach to visualize and analyze the structure and evolution of virtual tours and tourism from 2002 to 2022, based on data extracted from the Scopus database. The study revealed that the use of virtual tours in tourism is indeed prevalent as evidenced through analysis via the R software. Specifically, the study has addressed the most influential authors and journals, the most productive and cited countries, the most productive affiliations, and the most commonly used keywords in the field. In addition, the study also provides key information on the keyword trends which may provide opportunities for future researchers to sets out the future research trajectory.

However, this study constitutes its limitation. First, the study only reviewed articles that were published in the English language, therefore the publications from major books, dissertations, and conference proceedings were excluded from our sample. Furthermore, the use of the "tourism" term to obtain scientific publications about the virtual tour in the tourism context, in general, can be seen as another limitation of the study. Subsequent studies may take the opportunity to analyze virtual tours in a specific context (e.g., hospitality), and to include other sources (i.e., books, dissertations, conference proceedings). An overall evaluation indicates that research on virtual tours and tourism has increased in recent years. Studies that have an impact on the literature make significant contributions to the formation and development of the relevant discipline.

This study is expected to make significant contributions and serve as a guide to both the field of virtual tours and the researcher who has formed this area. This study draws whole new insights and trends in the integration of virtual tours in tourism as part of an effort for the industry to embrace the perks of technologies, especially post-COVID. By mapping what is known, the research also provides a high potential to help industrial practitioners, especially hoteliers to get a better picture of how technology (i.e., virtual tours) can empower tourists' desire for the tourism sites.

Additionally, the present study contributed critically to ascertaining relevant research aspects on a virtual tour in tourism. Furthermore, the analysis and the graphical visualization are equally crucial, as they will benefit both researchers and practitioner, to better understand the state of the art of virtual tour in tourism, synthesizes existing knowledge, and offers scientific evidence of potential research gaps as well as revealing possibilities, directions, and paths for future study in this growing discipline of tourism studies.

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