

Bibliometric Analysis of Tourism Industry Resilience through Immersive Media During Pandemic

Trias Widha Andari

Visual Communication Design Department
Universitas Nahdlatul Ulama Sidoarjo
Sidoarjo 61218, Indonesia
trias.dkv@unusida.ac.id

Athika Dwi Wiji Utami

Visual Communication Design Department
Universitas Nahdlatul Ulama Sidoarjo
Sidoarjo 61218, Indonesia
athika.dkv@unusida.ac.id

Sonhaji Arif

Visual Communication Design Department
Universitas Nahdlatul Ulama Sidoarjo
Sidoarjo 61218, Indonesia
sonhaji.dkv@unusida.ac.id

Putra Uji Deva Satrio

Visual Communication Design Department
Universitas Nahdlatul Ulama Sidoarjo
Sidoarjo, Indonesia
rio.dkv@unusida.ac.id

Abstract

During the coronavirus pandemic, human mobility and access to tourist attractions are very limited. Thus, people who work in the tourism industry must think harder. They need to find other ways to provide a traveling experience while the tourists are staying at home. Immersive media is a technology that could be the alternative solution to this problem. In the tourism industry, immersive media is used in the form of augmented reality (AR), virtual reality (VR), mixed reality (MR), and extended reality (XR). The objective of this research is to observe the trend of research themes related to immersive media in the tourism industry by using bibliometric analysis. The data is taken from several related research themes from 2019 – 2021. The result of data analysis shows that researches related to immersive media for the tourism industry are dominated by reviews of media selection (AR, VR, MR, XR), selected objects, and the impact of using immersive media. The results showed that there were research topics related to the use of immersive media in the tourism industry with the most popular keywords (1) virtual reality experience, (2) virtual reality effect, (3) virtual reality tourism, (4) tourism application, and (5) immersion game development. In the last three years, this has gained great interest from researchers. It indicates a positive trend which is predicted to develop in the following years

Keywords

Bibliometric Analysis, Immersive Media, Media Resilience, Tourism Industry, Virtual Reality

1. Introduction

The coronavirus pandemic since 2019 has changed many things. Activity restriction, lock downs, and physical distancing are new human habits. Humans are instructed to spend more time at home to avoid crowds. A number of people have even lost their jobs due to this limitation of activity. This condition has various impacts on various sectors. People who work in the health sector are required to work harder (Donthu, 2020). Several countries had experienced shortages of health workers due to this. On the other hand, the entertainment and tourism industry have decreasing visitors (Donthu, 2020). Humans experience consumption patterns that are different from before. Humans are becoming closer to the internet and interacting more through social media.

The tourism industry is a sector that is quite crucial. This sector involves many activities and workers in it. Physical distancing causes people to delay and cancel trips to various tourist attractions. The decline in visitor activity in the tourism industry requires all parties to think hard. The tourism industry must survive to cope with the impact of the coronavirus pandemic.

A number of tourism industries adopt technologies to survive in the midst of the coronavirus pandemic. Providing virtual experiences to consumers who are staying at home is one of the technological adaptations used in the tourism industry. Virtual Reality (VR) as part of immersive media can provide the sensation of 'being there' to consumers (Itani, 2021). One of the uses of immersive media in the tourism industry is virtual tours. Through virtual tours, consumers can experience virtual trips to tourist attractions.

The use of immersive media in the tourism industry which has grown significantly during the coronavirus pandemic has become an interesting topic for research. This study aims to determine the trend of research topics related to this problem. The results of this study can be used as a reference for selecting research topics related to immersive media in the tourism industry from various aspects.

2. Literature Review

2.2 Immersive Media as New Innovation in Tourism Industry

Market conditions and habits are changing in line with the coronavirus pandemic. No one can predict when the coronavirus pandemic will end. Therefore, humans need to innovate to be able to survive in the midst of a prolonged pandemic. The tourism industry, which used to be an attraction for domestic and foreign tourists, must be able to survive with these conditions. If not, the tourism industry will experience greater losses. Tourism industry suppliers also need to provide alternative methods if something similar will happen in the future.

Immersive media is a digital technology that can eliminate the distance between the real world and the virtual world. This technology is useful in overcoming the problems faced by the tourism industry during the coronavirus pandemic. Immersive media brings consumers to feel the sensation of telepresence, which they feel like going to a real place where is accessed remotely (Rodriguez, 2020).

Although still relatively new, the use of immersive media in the tourism industry has a considerable influence. The use of VR, for example, can present higher sensory stimulation compared to conventional media. Immersive media can also represent objects more realistically and provide information needed by consumers (Yung, 2021). Immersive media can also save the originality of local residents who live around tourist attractions. So far, tourist arrivals are considered to weaken the authenticity of local culture. This is because local residents are required to behave in accordance with tourist expectations (Gegung, 2021). Through immersive media that can be accessed remotely, these problems can be avoided.

Immersive media technology gives benefits to tourism industry suppliers because it can improve their image through consumer satisfaction when making virtual trips in a short time (Rodriguez, 2020). This ease of access can also be used by tourist objects that are rarely visited, such as museums and cultural heritage sites. Activities that were previously difficult to do in museums are now easier to organize through immersive media. One of them is holding collaborative exhibitions of museum collections using VR (Carvajal, 2020). Visitors also have more freedom to explore tourist attractions without worrying about disturbing other visitors and accidentally damaging the exhibition collections. This media also eliminates the limitations that some people have, such as people with disabilities.

Before the coronavirus pandemic, immersive media were mostly used by new technology developers to attract visitors. However, after the coronavirus pandemic, immersive media began to be widely applied by traditional tourism industry suppliers. The tourism industry in a number of countries has used immersive media to attract the attention of pandemic consumers. Singapore Tourism Board hosted interactive virtual parties for domestic and international tourists (Kwok, 2020). One of the inns with the oldest water sources in Japan offers swimmers a virtual experience via VR headsets (Kwok, 2020). In Abu Dhabi, the Department of Culture and Tourism offers F1 virtual rides and 3D virtual tours (Kwok, 2020). There are many more examples of the use of immersive media in the tourism sector.

2.3 The Advantages of Bibliometric Analysis in Finding Trends in Research Topics

The use of the bibliometric term was first introduced by Pritchard in 1969 and is still used today (Thanuskodi, 2010). Bibliometric analysis is a quantitative method that calculates the correlation of information from published research results. Some data that can be used for bibliometric analysis are the number of publications, the number of citations, co-citation analysis, and co-occurrence. The advantages of bibliometric analysis are detecting publication patterns, analyzing relationships between authors, analyzing citations, measuring trends to predict new research themes (Thanuskodi, 2010). This method can be used in various fields of science.

There are two applications used as a tool for bibliometric analysis in this study. The first application is Publish or Perish (PoP) which was developed in 2006. This application uses Google Scholar Query to get citation information. In this study, the PoP application was used to collect research report data related to immersive media in the tourism industry which was detected through keywords. The data generated by this application include the number of articles, the number of citations, and the h-index (Aulianto, 2019). The second application is VOSViewer which was used to analyze and visualize the data that have been collected. This application can represent data in maps and also categorize them based on clusters (Thanuskodi, 2010). In this research, VOSViewer was used for analysis and visualization.

3. Methods

The method used in this study consisted of three stages as shown in Figure 1. The first stage was data collection, which was the process of collecting data with the help of the Publish or Perish (PoP) application to find out research topics related to the use of immersive media in the tourism industry sector. Research title searches were based on relevant keywords.

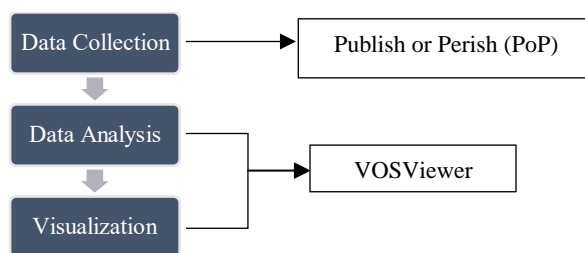


Fig 1. Research method (Source: Authors' Illustration)

The second and third stages were data analysis and visualization using the VOSViewer application. The analyzed data came from a collection of research related to the keywords searched in the first stage. The data were then visualized based on the category of research object and year of publication. Visualization is shown in the results and discussion section.

4. Data Collection

The search for research results with the theme of immersive media in the tourism industry used three keywords, namely (1) Immersive Media, (2) Extended Tourism, and (3) Immersive Tourism. The collection was based on the year the coronavirus pandemic started, which was 2019 to 2021. The limit on the number of studies analyzed for each keyword is 200 research titles with the Scopus Index.

In accordance with the data search results using the PoP application, five clusters were found based on the category of interrelationships among research fields. There were five clusters derived from search results based on keywords found in Table 1. Cluster 1 consists of eight items, Cluster 2 consists of six items, Cluster 3 consists of six items, Cluster 4 consists of five items, and Cluster 5 consists of five items. The data will be analyzed and visualized in the next discussion. The five clusters have direct and indirect attachments to each other.

Table 1. Data cluster (Source: Authors)

Cluster	Occurance Items
Cluster 1	(1) Augmented Reality (2) Cultural Heritage (3) Development (4) Game (5) Immersion (6) Outcome (7) Research

	(8) World
Cluster 2	(1) Application (2) Challenge (3) Design (4) Evaluation (5) Immersive Storytelling (6) Tourism
Cluster 3	(1) Effect (2) Emotion (3) Immersive Virtual Reality (4) Impact (5) Presence (6) Sense
Cluster 4	(1) Covid (2) Reality (3) Use (4) Video (5) Virtual Reality
Cluster 5	(1) Case (2) Destination (3) Experience (4) Role (5) Tourist

5. Results and Discussion

5.1 Research Topic Trend in Tourism Industry Resilience through Immersive Media

In Figure 3 there is a co-occurrence map which is a visualization of the analysis using the VOSViewer application. The topic of discussion related to immersive media in the tourism industry consists of five clusters. Cluster one has a strong attachment to the topic of 'games'. In cluster one, the topic of 'game' is directly related to 'immersion', 'world', 'development', and 'augmented reality'. The topic of 'game' also has an indirect relationship with 'research' and 'cultural heritage'. Outside of the cluster one, 'game' has a direct relationship with 'role' and 'destination'.

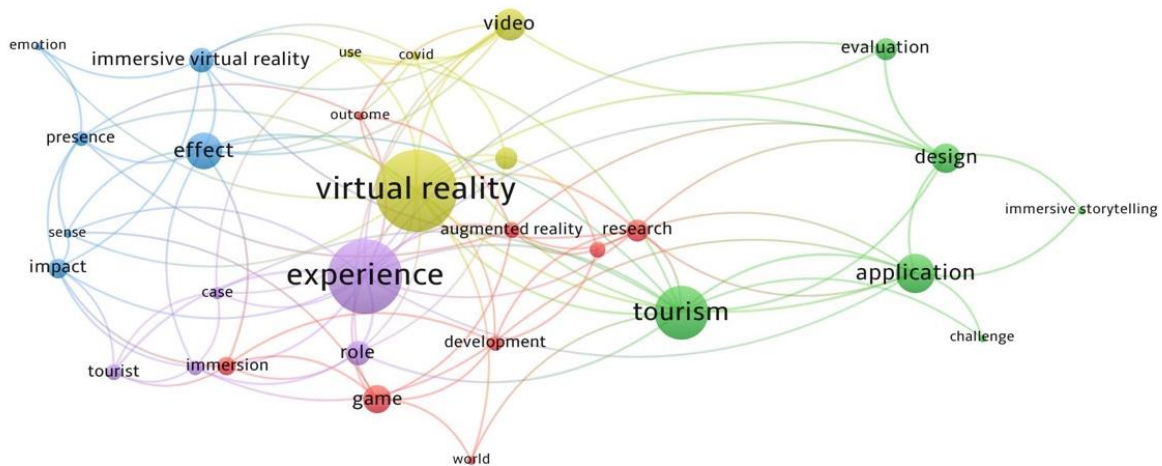


Fig 3. Co-occurrence Map (Source: Authors)

Cluster two has a strong attachment to the topic of 'tourism'. In cluster two, the topic of 'tourism' is directly related to 'application' and 'design'. The topic of 'tourism' has an indirect relationship with 'challenge', 'immersive storytelling', and 'evaluation'. Outside of cluster two, 'tourism' has a direct relationship with 'experience', 'research', 'world', and 'role'.

Cluster three has a strong attachment to the topic of 'effect'. In cluster three, the topic of 'effect' is directly related to 'immersive virtual reality', 'presence', 'sense', and 'impact'. The topic of 'effect' has an indirect relationship with

'emotion'. Outside of cluster three, 'effect' has a direct relationship with 'immersion', 'destination', 'virtual reality', 'video', 'tourism', and 'covid'.

Cluster four has a strong attachment to the topic of 'virtual reality'. In cluster four, the topic of 'virtual reality' has a direct relationship with 'video', 'reality', and 'use'. The topic of 'virtual reality' has an indirect relationship with 'covid'. Outside of cluster four, 'virtual reality' has a direct relationship with 'outcome', 'experience', 'augmented reality', 'effect', 'experience', and 'development'.

Cluster five has a strong attachment to the topic of 'experience'. In cluster five, the topic of 'experience' has a direct relationship with 'role', 'tourist', 'destination', and 'case'. Outside of cluster five, 'experience' has a direct relationship with 'virtual reality', 'augmented reality', 'impact', 'sense', 'game', 'research', and 'application'.

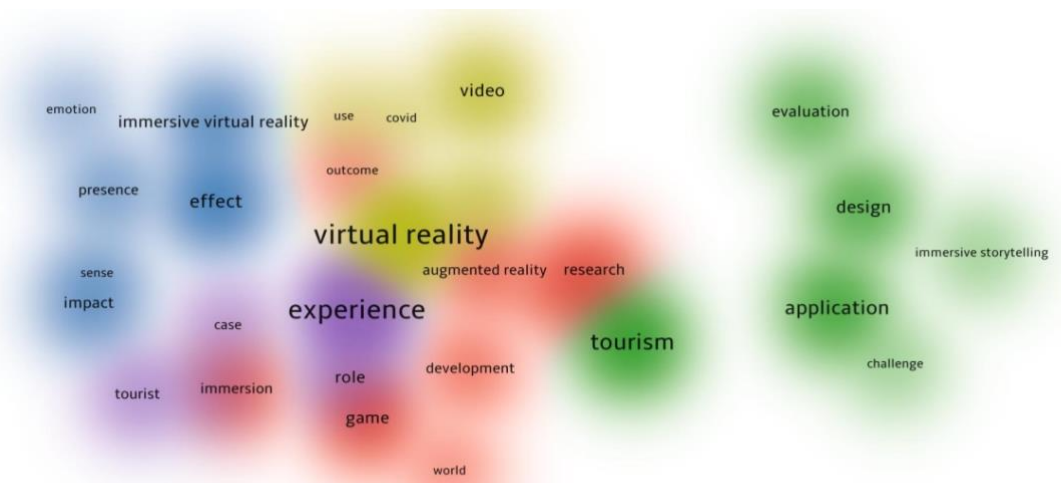


Fig 3. Density Visualization Analysis (Source: Authors)

In Figure 3 there is a categorization based on density visualization which provides an overview of the main areas in the bibliometric network. Areas that have high concentration in Figure 4 are 'virtual reality', 'experience', 'game', 'effect', 'tourism', 'application', and 'research'. Some topics that have low density have a direct relationship with high density topics.

Based on the data visualization, there are five topics that are trending in research about the use of immersive media in the tourism industry during the coronavirus pandemic. This conclusion is based on the relationship between research topics in the co-occurrence map and density visualization. The five research topics are (1) virtual reality experience, (2) virtual reality effect, (3) virtual reality tourism, (4) tourism application, and (5) immersion game development. The result of data analysis shows that researches related to immersive media for the tourism industry are dominated by reviews of media selection (AR, VR, MR, XR), selected objects, and the impact of using immersive media.

5.2 Productivity of Research Author in Tourism Industry Resilience Field

Researcher productivity was taken from data related to the number of researchers who wrote the theme of tourism industry resilience. Data were obtained from the year of research in accordance with the results of previous studies. Data visualization is shown in Figure 4. Data visualization shows an increase in the number of studies related to immersive media in the tourism industry during the coronavirus pandemic from 2019-2021. In 2019, there were several researchers who wrote more than two articles with the same theme. In 2020, there were researchers who wrote more than one article with the same theme.

In 2021, the number of researchers increase compared to the previous year. Research with the theme of immersive media increase along with the development of the use of immersive media in the tourism industry to overcome the impact of the coronavirus pandemic. The increase in years is in line with the number of studies related to immersive media. This indicates a positive trend which is predicted to develop in the following years.

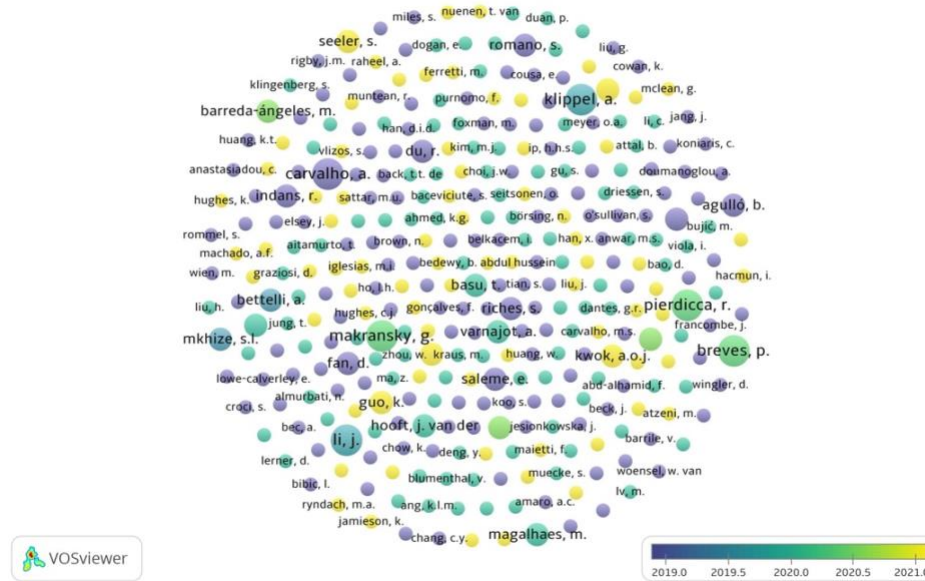


Fig 4. Author Overlay Analysis (Source: Authors)

6. Conclusion

In this study, the theme raised for bibliometric analysis is the use of immersive media as a means of surviving the tourism industry in the midst of the coronavirus pandemic. The urgency of this research is to find out research topics that can be developed during the coronavirus pandemic, especially those related to digital media. The data used were researches with related themes published in 2019-2021 based on the Scopus Index. The bibliometric analysis method in this study used the Publish or Perish (PoP) application and VOSViewer.

The result of data analysis shows that researches related to immersive media for the tourism industry are dominated by reviews of media selection (AR, VR, MR, XR), selected objects, and the impact of using immersive media. The results showed that there were research topics related to the use of immersive media in the tourism industry with the most popular keywords (1) virtual reality experience, (2) virtual reality effect, (3) virtual reality tourism, (4) tourism application, and (5) immersion game development. There were other sub-topics that were still related to the five topics. Based on the number of studies each year, researchers who wrote this theme showed a positive trend. The results of this analysis indicated that the selection of immersive media themes in the tourism industry is predicted to have the potential to develop in the following years.

Through this study, the researchers hope that the research results will provide an overview of the selection of themes related to immersive media in the future. Even though the coronavirus pandemic is starting to show a downward trend, immersive media are still popularly used in various industries to meet various needs. Therefore, the selection of research themes related to these objects can still be deepened.

References

- Aulianto, D, Pemanfaatan Aplikasi “Publish Or Perish” Sebagai Alat Analisis Sitasi Pada Jurnal Kajian Komunikasi Universitas Padjadjaran, *Seminar Nasional MACOM III Universitas Padjadjaran 2019 “Communication and Information Beyond Boundaries”*, 2019.
- Carvajal, D, Virtual museums. Captured reality and 3D modelling. *Journal of Cultural Heritage*, 45, pp. 234-239, 2020.
- Donthu, N, Effects of COVID-19 on Business and Research. *Journal of Business Research*, 177, pp.284-289, 2020
- Gegung, E, International Tourism And The Covid-19 Pandemic: The Use of Virtual Reality to Increase Tourism Destination Sustainability and How Users Perceive The Authenticity of VR Experiences, *Jurnal Kepariwisata Indonesia*, 15 (1), pp. 9-15, 2021
- Itani, O, Light at the end of the Tunnel: Visitors’ Virtual Reality (Versus In-Person) Attraction Site Tour-Related Behavioral Intentions During and Post-COVID-19, *Tourism Management*, 84 (2021), pp. 1-12, 2021.

Kwok, A, COVID-19 and Extended Reality (XR). *Current Issues in Tourism*, 24(14), pp. 1935-1940, 2020.

Rodriguez, M, *The Impact of Virtual Reality Technology on Tourists' Experience: A Textual Data Analysis*,
Springer-Verlag GmbH Germany, 2020.

Thanuskodi, S, Journal of Social Sciences: A Bibliometric Study, *Journal of Social Sciences*, 24(2), pp. 77-80, 2010.

Yung, R, Virtual Reality and Tourism Marketing: Conceptualizing A Framework on Presence, Emotion, and
Intention, *Current Issues in Tourism*, 24(11), 1505-1525, 2021.

Acknowledgments

This research was supported in part by the Institute for Research and Community Services at the Universitas Nahdlatul Ulama Sidoarjo, Indonesia.

Biographies

Trias Widha Andari is a researcher and lecturer of Visual Communication Design Department at the Universitas Nahdlatul Ulama Sidoarjo, Sidoarjo, Indonesia. She earned a Bachelor of Design in Visual Communication Design from Universitas Negeri Malang, Indonesia; and a Master of Design in Visual Communication Design from Institut Teknologi Bandung, Indonesia.

Athika Dwi Wiji Utami is a researcher and lecturer of Visual Communication Design Department at the Universitas Nahdlatul Ulama Sidoarjo, Sidoarjo, Indonesia. She earned a Bachelor of Education in Electrical Engineering Education from Universitas Negeri Surabaya, Indonesia; and a Master of Education in Technology and Vocational Education from Universitas Negeri Yogyakarta, Indonesia.

Sonhaji Arif is a researcher and lecturer of Visual Communication Design Department at the Universitas Nahdlatul Ulama Sidoarjo, Sidoarjo, Indonesia. He earned a Bachelor of Education in Fine Arts Education from Universitas Negeri Malang, Indonesia; and a Master of Art in Art Creation and Study from Institut Seni Indonesia Yogyakarta, Indonesia.

Putra Uji Deva Satrio is a researcher, lecturer, and Head of Program of Visual Communication Design Department at the Universitas Nahdlatul Ulama Sidoarjo, Sidoarjo, Indonesia. He earned a Bachelor of Design in Visual Communication Design from Universitas Negeri Malang, Indonesia; and a Master of Art in Art Creation and Study from Institut Seni Indonesia Yogyakarta, Indonesia.