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Games in Tourism Research: Knowledge Structure Mapping and Uncharted Business Perspectives

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ABSTRACT

In the context of the tourism and hospitality sector, games can enhance experiences and engagement for tourists, contributing to the sustainability of destination. Conversely, the development of digitalization is perceived as accelerating transformations in games designed to address issues ranging from micro to more multifaceted levels. This paper employs bibliometric analysis to investigate the evolution of games in the tourism sector from 2016 to 2025, comparing growth and citation impact. It identifies emerging research topics through cluster and factorial analysis, revealing thematic clusters and conceptual shifts over the past decade by utilising keyword queries in the Scopus database. The investigation utilised VOSviewer and RStudio (Bibliometrix) to examine publications from 2016 to 2025, including countries, funding institutions, authors, and keywords within the specified domain. The study explains the role of funded organizations in facilitating research production, revealing that European countries continue to dominate both paper production and citations. China has the third rank among Asian countries. The study highlights the significance of games in enhancing capacity building and business opportunities within the field of tourism. The findings provide a framework for understanding how games could achieve a strategic position not just in micro-scale simulations but also in finding tourism business prospect in the near future.

SARI PATI

Dalam sektor pariwisata dan perhotelan, permainan (games) dapat meningkatkan pengalaman serta keterlibatan wisatawan, yang pada gilirannya berkontribusi terhadap keberlanjutan suatu destinasi. Di sisi lain, perkembangan digitalisasi dipandang sebagai faktor yang mempercepat transformasi dalam permainan yang dirancang untuk menangani berbagai persoalan, mulai dari tingkat mikro hingga tingkat yang lebih kompleks. Makalah ini menggunakan analisis bibliometrik untuk meneliti evolusi permainan di sektor pariwisata dari tahun 2016 hingga 2025, dengan membandingkan pertumbuhan serta dampak sitasi. Melalui analisis klaster dan faktorial, penelitian ini mengidentifikasi topik-topik riset yang sedang berkembang, serta mengungkap klaster tematis dan pergeseran konseptual selama satu dekade terakhir dengan memanfaatkan kueri kata kunci dalam basis data Scopus. Investigasi ini menggunakan perangkat lunak VOSviewer dan RStudio (Bibliometrix) untuk menelaah publikasi dari tahun 2016 hingga 2025, mencakup aspek negara, lembaga pendanaan, penulis, dan kata kunci dalam bidang tersebut. Studi ini menjelaskan peran lembaga pendanaan dalam memfasilitasi produksi riset, dan menunjukkan bahwa negara-negara Eropa tetap mendominasi, baik dalam jumlah publikasi maupun sitasi. Tiongkok menempati peringkat ketiga di antara negara-negara Asia. Studi ini menyoroti pentingnya permainan dalam meningkatkan pengembangan kapasitas dan peluang bisnis di bidang pariwisata. Temuan ini menyajikan kerangka kerja untuk memahami bagaimana permainan dapat mencapai posisi strategis—tidak hanya dalam simulasi berskala mikro, tetapi juga dalam menemukan prospek bisnis pariwisata di masa depan.

INTRODUCTION

The use of games has evolved from pure recreation to a multidisciplinary strategy (Gyaurov et al., 2025; Pasca et al., 2021). Research on games derives from the implementation of game design elements in non-gaming contexts (Xu & Buhalis, 2021) and is apparent in educational and behavioral modification environments. Research indicates that the gaming business is expanding, with the global market projected to reach $97 billion by 2030 (Stylos & Vassiliadis, 2026). The use of games is attractive because of its ability to integrate with several industries, such as healthcare, education, and business. This suggests that games can produce co-creation value and contribute in achieving business objectives through immersive experiences (Pasca et al., 2021).

Because of its user-centric and experience-driven orientation, which combines game mechanics like points, challenges, and storylines, games have potential applications in the tourist and hospitality sectors (Hunicke et al., 2004). This can facilitate a flow experience from the tourist's viewpoint (Sigala, 2015). In particular, for the younger generation of tourists looking for engaging, real-life interactions in a digital setting, Sigala (2015) highlighted the strategic importance that games play on improving destination appeal, user engagement, and loyalty. Games fundamentally offer distinctive experiences by educating tourists on the promotion of sustainable tourism principles (McGrath et al., 2020).

The progress of research on games within the field of tourism reveals a gap, as the emphasis remains on user perception and involvement. Conversely, ambiguity continues relating to the definitions of gamification, game-based learning (Pérez-lópez & Navarro-mateos, 2023) and, serious games (Angel Torres-Toukoumidis & Palma-Ruiz, 2021; Gwenhure, A., K., & Nam, 2025; Oliveira & Petersen, 2014). However, there is still lack of thorough discussion about how games interact with the tourism sector and its broader ecosystem (Pasca et al., 2021), which may cause difficulties for practitioners when implementing them (Gaalen et al., 2021). At first, games are used as playful activities meant for entertainment (Parapanos & Michopoulou, 2023; Schell, 2019). Consequently, more detailed explanations are required to clarify game uses that extend beyond mere recreation (Gyaurov et al., 2025).

Gamification is widely recognized and is simply defined as the application of game mechanics in contexts that are not games (Deterding et al., 2011). Over time, this definition has evolved to include elements of intrinsic motivation and applications beyond entertainment, namely education, politics, and health (Brito et al., 2018). In contrast, game based learning refers to leveraging games specifically for educational purposes and skill development, where the rules of the game introduce constraints and shape unique learning experiences compared to traditional teaching methods (Buckley & Doyle, 2016; Nair, 2022). Serious games are designed to educate and influence players by enhancing their knowledge and skills (Susi et al., 2007). These games blend elements of fantasy and reality (Seaborn & Fels, 2015) and typically feature clear objectives, challenges, rules interactivity and progress tracking, guiding players through tasks that must be accomplished to achieve success (Wouters & Van Oostendorp, 2013). Furthermore, the lack of research that incorporates collaborative technological advancements in the tourism and hospitality sector offers a potential avenue for further investigation.

This study seeks to summarise existing knowledge about games and classify their development to comprehend its prospective applications in the tourism sector. This research also seeks to outline a future research agenda and examine practical business implications. The paper examines these patterns to offer a framework for

innovation in the tourism and hospitality sector, positioning games as a crucial approach for achieving sustainable growth in the future. The study presents a thorough overview by addressing the following Research Questions (RQs):

RQ 1: What is the path of publication growth, and how does it relate with the average citation rates of these documents?
RQ 2: What is the regional distribution of papers related to game development and tourism, and how does research funding align with this distribution from 2015 to 2025?
RQ 3: What emergent research topics deserve attention over the 2015–2025 period?
RQ 4: What are the relationships among authors, keywords, and their corresponding research dissemination venues (journals)?
RQ 5: What future research topics and business implications emerge from this study?

METHODS

Bibliometric studies facilitate comprehensive understanding by analysing the information found in the empirical research within the Scopus database (Donthu et al., 2021). This approach is frequently employed in multiple disciplines to track publication trends and assess the productivity of researchers within particular fields (Mubarok & Istiana, 2022). Mapping existing knowledge presents an opportunity to assess the evolution of game-related insights encapsulated in journal papers across many disciplines for analysis.

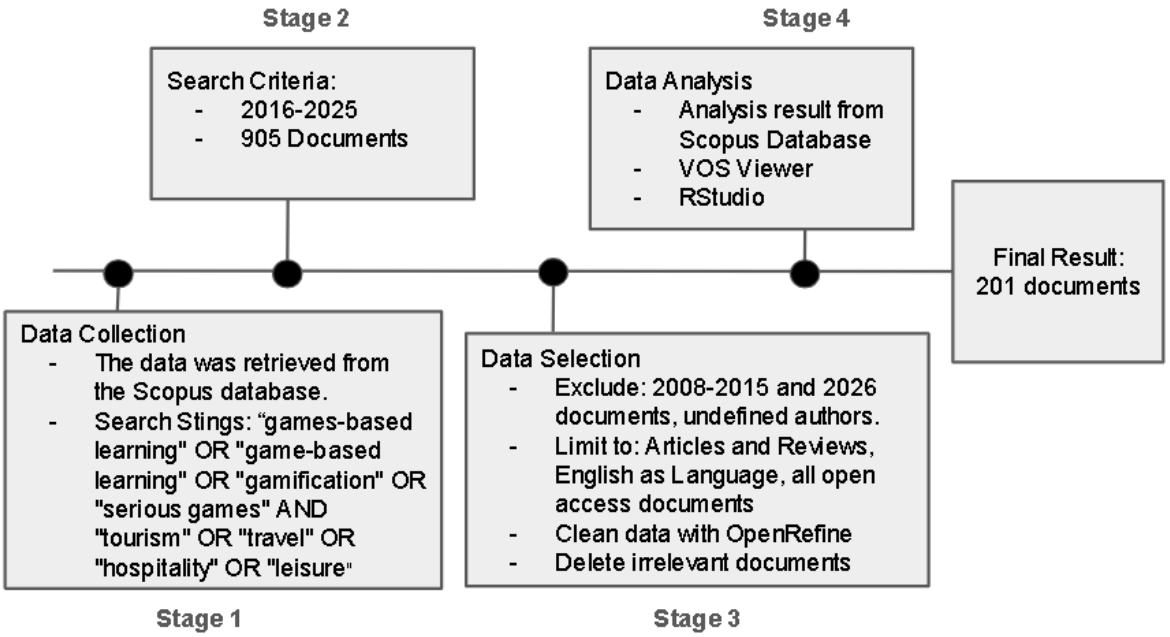


Figure 1. The Stage of data search and collection
Source: Authors' own work

Bibliometric analysis involves examining the spread of publications to assess the influence of articles on knowledge development across many disciplines, utilising statistical techniques to offer a complete perspective on the topic (van Eck & Waltman, 2010). To perform the research, bibliometric data from the Scopus database,

downloaded between 2015 and 2025, were obtained in in 22th December 2025. The search produced 905 documents. The search included publications just from 2016 to 2025. Article selection concentrated on excluding undefined authors, restricting to papers published in English, confining document types to journals and reviews, ensuring English as the primary language, and included only open access resources leading to 206 documents. Moreover, the database provided access to essential information, including the author's affiliation, keywords, and references for each publication, which were crucial for this study. Moreover, documents are refined through OpenRefine Software, resulting in 201 documents for analysis in the following phase. RStudio is utilised alongside the Bibliometrix package and its Biblioshiny interface, specifically employing the Bibliometric thematicMap() function with default parameters (Prasetya et al., 2025) facilitating the generation of thematic maps from keyword data that can be categorised into separate clusters.

RESULTS AND DISCUSSION

Figure 2 illustrates the increasing trend of documents generated from 2016 to 2025. During the first period from 2016 to 2018, document growth was minimal and static, with the total remaining below 10 papers. In 2019, a period of expansion commenced with the number of papers escalating from 14 in 2019 to 29 in 2021. In 2022 and 2023, there were minor declines of -6.90% and -14.81%, respectively; however, in 2025, the publishing volume peaked at 40 papers, reflecting a 37.93% increase from the preceding year. The comparison of total publication growth to average citations from 2016 to 2025 is illustrated in Figure 2.

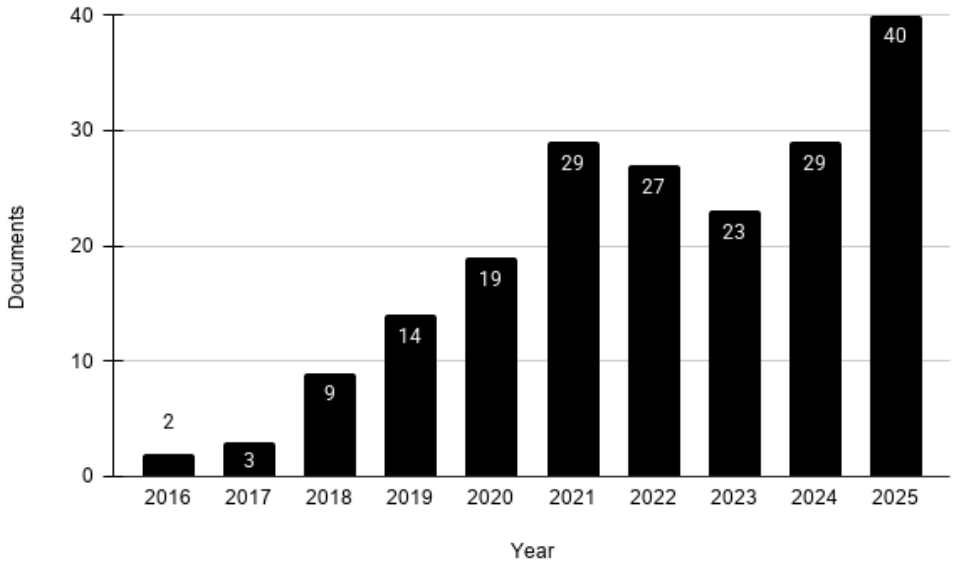


Figure 2. Publication Growth
Source: Authors' own work

Figure 3 illustrates the comparison between total publication growth and average citations from 2015 to 2025.During the initial phase from 2016 to 2018, the number of articles produced was limited, with around 2 documents in 2016, and 3 in 2017; however, the average citations shown significant growth, rising from about 5.6 to 6.3. In contrast, despite the increase in document number in 2018, there was little corresponding rise in citations; instead, the average citations decreased from 6.3 to 5.3 that year.

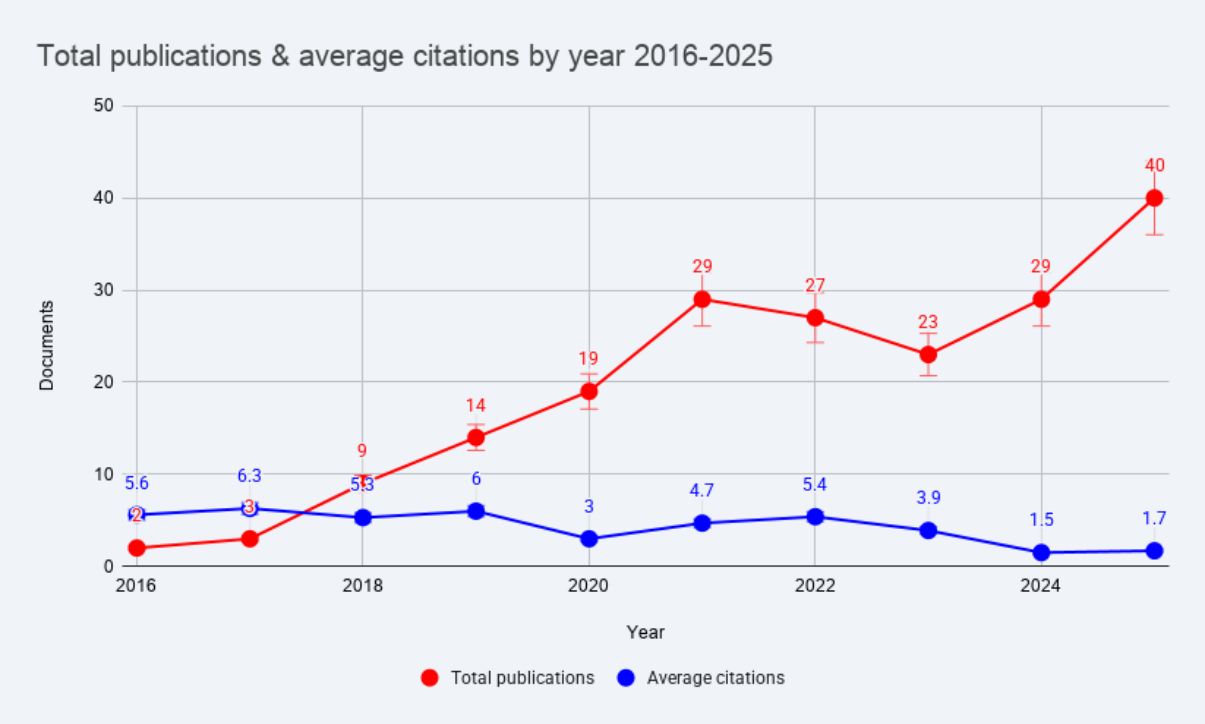


Figure 3. Total Publications and Average Citations by year 2016-2025
Source: Authors' own work

A clear pattern is observed in the varying trend of average citations from 2019 to 2021. In 2022, the average citation rate was 5.4, thereafter declining to a low of 1.5 by 2024. Subsequently, there was a little increase in activity in 2025, with average citations reaching 1.7

Geographical Distributions

The table 4 reveals that Spain, the United Kingdom, and China hold the top three ranks, each producing over 50 documents on this topic. This indicates that the research emphasis in this field is primarily driven by European countries, followed by Asian nations. Europe's significant contribution is further evidenced by its dominance in the "Top Ten" list of documents produced regarding this research topic.

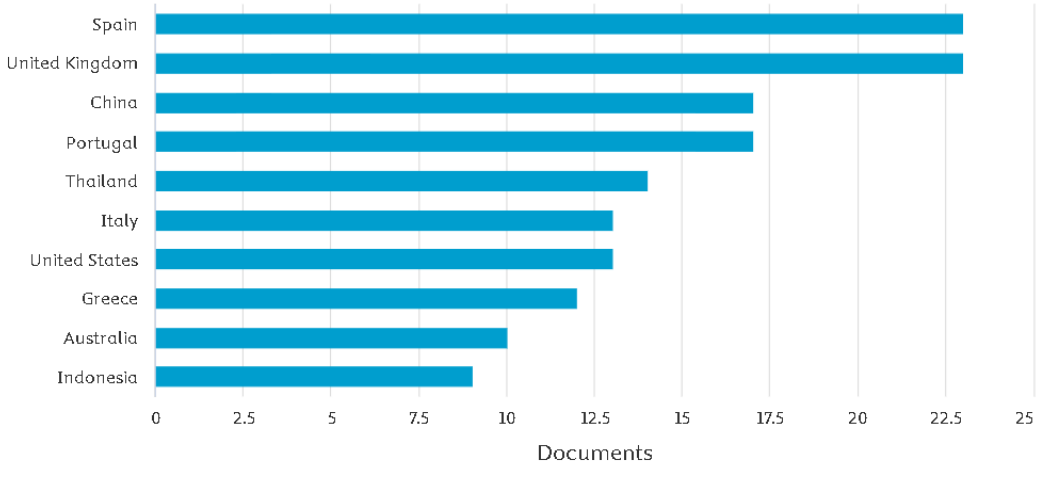


Figure 4. Countries with the high number of publications
Source: Scopus.com

Table 1 indicates that Spain, the United Kingdom, and China hold the top three positions, each generating more than 50 documents on this subject. This signifies that the study focuses in this domain is predominantly led by European countries, followed by Asian nations. Europe's substantial contribution is further demonstrated by its position in the "Top Ten" list of documents generated on this research subject.

Table 1. Top Ten Funding Sponsor

No	Funding Sponsor	Documents
1	Fundação para a Ciência e a Tecnologia	12
2	European Regional Development Fund	10
3	European Commission	9
4	Horizon 2020 Framework Programme	7
5	Ministry of Science and Technology, Taiwan	4
6	Economic and Social Research Council	3
7	Grantová Agentura České Republiky	3
8	Ministry of Education	3
9	Nederlandse Organisatie voor Wetenschappelijk Onderzoek	3
10	Prince of Songkla University	3

Source: Scopus.com

Figure 5 illustrates the total citations and average article citations per area, which can be examined together with their sponsors or grant sources for research purposes. China and South Korea emerge as the leading representatives of the Asian continent. Despite China's substantial total citations, its average is inferior to those of European countries. This indicates that publications generated by European nations show a higher impact factor relative to those from Asian nations.

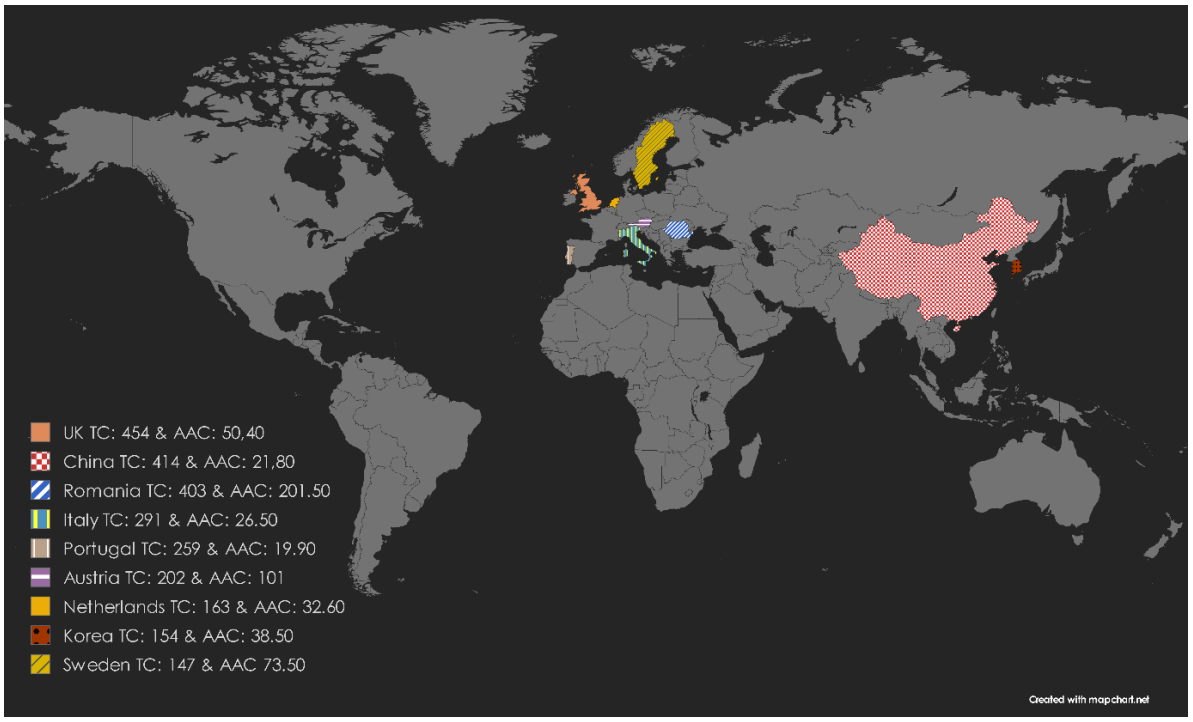


Figure 5. Visualisation of Geographical Distribution Based on Total Citations and Average Article Citations

Source: Authors' own work

The relationship between financial sponsors and the allocation of contributions, as evidenced by Total Citations (TC) and Average Article Citations (AAC) each area, offers an essential message: nations with substantial research funding will excel in this domain. For example, Portugal's Fundação para a Ciência e a Tecnologia has enhanced the nation's research status. The Economic and Social Research Council in the UK and the Nederlandse Organisatie voor Wetenschappelijk Onderzoek in the Netherlands have markedly enhanced the overall citations for research undertaken in the countries they represent. This amount of support is regarded as having a more extensive global impact than funding from Asian nations, which is typically more regionally concentrated.

A Look Inside at Three Field Plots Diagram

There are links between writers (AU), keywords (DE) in journals, and scientific sources (SO) that can be seen more clearly with a Three-Field Plot diagram. There are two parts: the focal point shows the main research themes or topics, and the left part lists the researchers or research groups who helped create those themes. On the other hand, the journals where this study is published are shown on the right. Link flows show the connections between things, making it easy to keep track of experts, what they discover, and the ways they share information (see Fig 6).

To keep things clear in educational settings, it is important to understand how these things are connected. This is especially interesting when looking at how themes have changed over the last ten years. In the illustration, the link flows between writers, keywords, and sources display this and uncover the key areas of study is becoming very important, as is sharing the information through different academic channels.

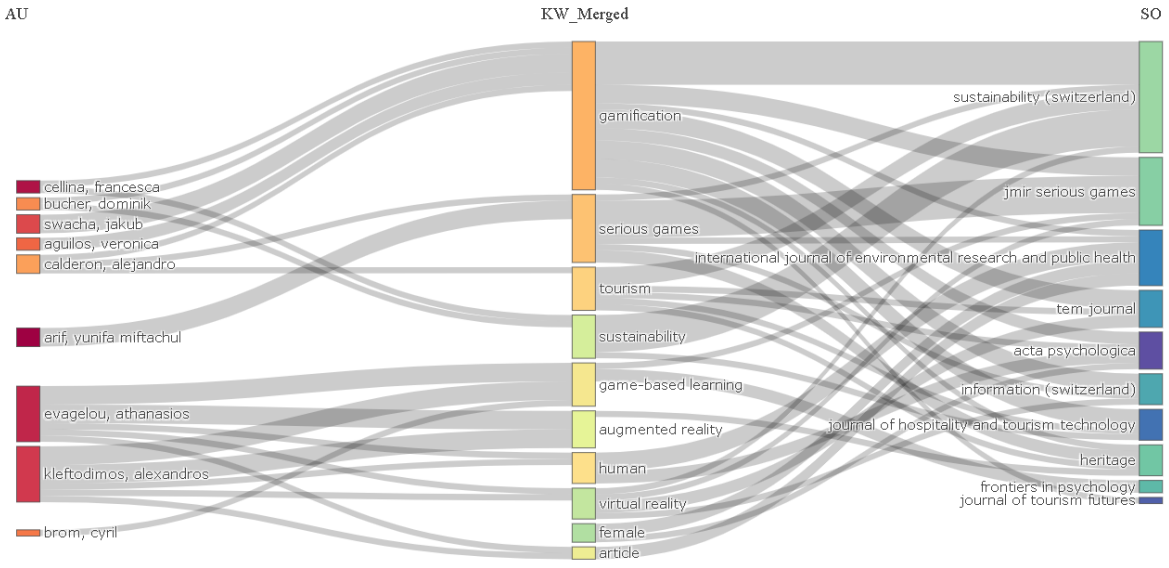


Figure 6. Three Field Plot: Authors - Keywords - Sources Relationship
Source: RStudio Data Processing

Gamification, game-based learning, and serious games are the primary emerging themes, as seen in figure 6. This suggests that these ideas are being applied in a variety of other domains, including tourism, where they are relevant to sustainability and other related challenges. Research on gamification is the most prominent, signifying a highly dynamic field of study. Simultaneously, serious games show their importance by aligning closely with gamification as a study subject, but they are generally more focused and application driven.

Sustainability is a subject of significant interest, especially in relation to environmental and social responsibility

studies. It is similarly linked to tourism contexts, similarly to game-based learning, augmented reality (AR), and virtual reality (VR); these themes underscore a relationship with technological utilization, particularly for education and immersive experiences in tourism. The introduction of the "human" theme signifies an emphasis on the human dimension, user experience, and psychological factors across diverse applications.

Figure 6 illustrates authors with strong collaborative patterns in gamification research. Location-based AR applications are emerging as innovative educational tools, with Kleftodimos et al. (2023) using gamification and storytelling to teach cultural heritage at prehistoric sites, and Evagelou, Kleftodimos, and Moustaka (2023) developing AR applications for outdoor environmental learning a prehistoric settlement, the prehistoric lake settlement of Dispilio in Kastoria. Their research is published in journals including the Journal of Hospitality and Tourism Technology and the Journal of Tourism Futures, situating them within the Innovation in Tourism Through Immersive Technology category. This illustrates how authors, by selecting particular keywords, position their work within defined thematic and publication contexts. This research indicates a domain marked by specialised communities that coalesce in interdisciplinary publications, highlighting its increasing maturity and ability to draw different contributions from many academic disciplines.

Gamification serves diverse educational functions: Cellina et al. (2019) created apps for personal development, Fernández-Ruano et al. (2022) demonstrated enhanced destination brand equity through gamified environmental experiences, and Aguilos and Fuchs (2022) showed that gamification boosts student motivation and self-directed learning in higher education despite implementation challenges. Meanwhile, scholars like Arif and Miftachul concentrate on games designed to teach sustainability, particularly addressing environmental and social sustainability topics, and are progressively investigating different possibilities with serious games (Arif et al., 2021, 2023)

Publication namely Sustainability (Switzerland) and the International Journal of Environmental Research and Public Health represent interdisciplinary domains focused on gamification approach within the environmental and public health context, forming part of the gamification and sustainability cluster. Conversely, journals like JMIR Serious Games are committed to specialized topics related to the creation and implementation of serious games, backed by an active community known as the Serious Games specialization cluster.

Emerging Area of Research

These emerging research topics apply co-occurrence analysis, revealing that gamification, tourism, serious games, tourism, human element, and game-based learning are the primary subjects within this field of study (see Table 2). The table demonstrates that Gamification functions as a central keyword within this study, with 100 occurrences following to the keywords Serious Games and Tourism

Table 2. Keyword Occurrences and Total Link Strength (TLS)

Keyword	Occurrences	Total link strength
Gamification	100	143
Serious games	33	42
Tourism	30	61
Human	21	136
Game-based learning	17	27
Article	15	108
Augmented reality	14	43
Sustainability	14	24
Virtual reality	14	43
Female	13	104
Education	12	26
Leisure	12	81
Male	12	96
Cultural heritage	11	22
Mobile applications	11	46
Adult	10	82
Physical activity	10	62
Students	10	26
Controlled study	8	69
Exercise	8	46
Mobile phone	8	20
Motivation	8	38
Psychology	8	38
Randomized controlled trial	8	57
Mental health	7	27
Video games	7	27
Ecotourism	6	12
Tourist behavior	6	16
Travel behavior	6	28

Source: Authors' own work

Considering the Total Link Strength, topics include Gamification (TLS: 143) and Human (TLS: 136) exhibit notable strength in their association with themes pertaining to the technologies employed in delivering gaming experiences. Strong associations with other studies are also evident in keywords that include adult, male and female, indicating that the research is predominantly centred on empirical investigations specifically in various segments. Based on the VOSviewer visualization results (see Fig. 7) derived from co-occurrence analysis, three distinct clusters are identifiable, each represented by the colours red, green, and blue (see table 3).

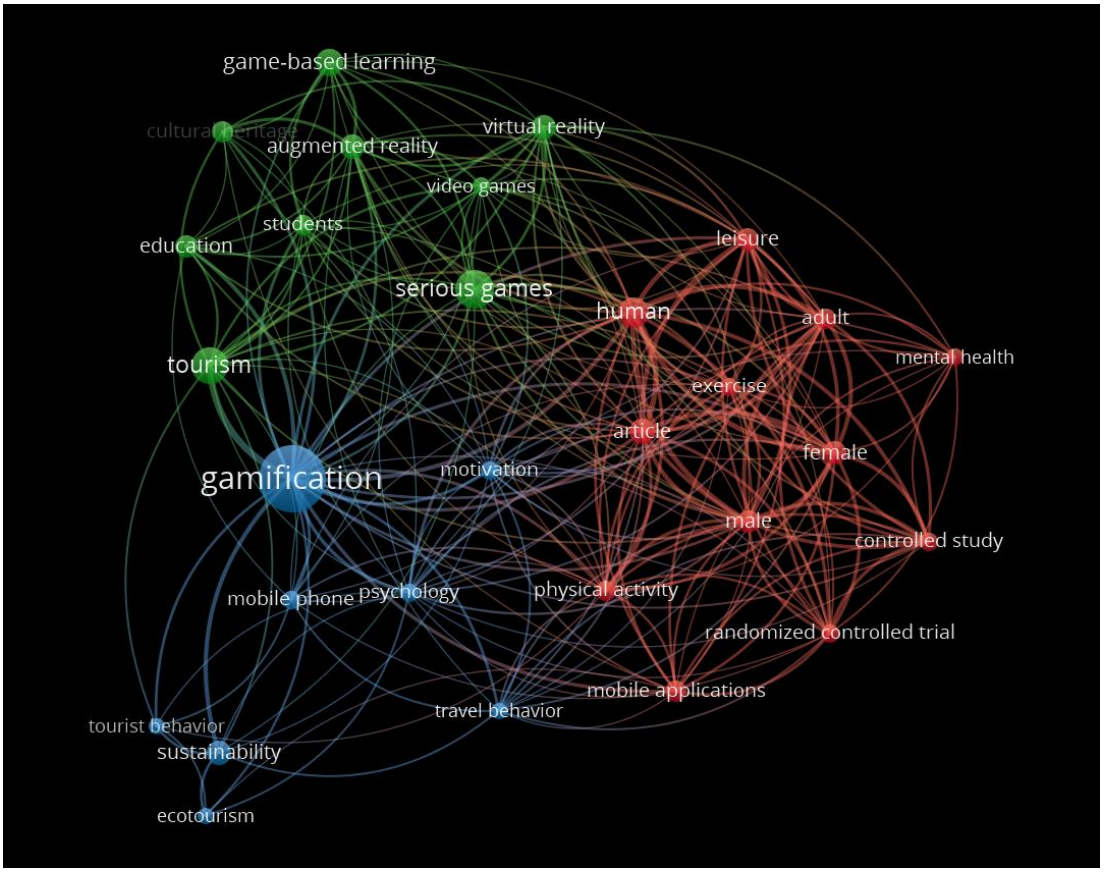


Figure 7. Cluster Visualization
Source: VOSviewer Data Processing

Cluster 1 (Red): Health based Leisure and Wellness Tourism. This cluster represents the specific outcome associated with the purpose of tourism and leisure. It shows the tourism segments categorized by gender (adult, female and male) with their activities such as exercise and physical activities. The outcome is the good condition of mental health. For tourism business, this is an opportunity to see the future market where the tourism packages can include clinically intervention for mental and physical well-being.

Cluster 2 (Green): Immersive Education through Game and Technology. This cluster signifies the importance of mobile technology and human engagement. Research within this cluster concentrates on immersive technologies that can be combined with pedagogical approaches such as Game based learning and Serious games. The use of digital technology can propose an interactive learning experience, especially in tourism and cultural heritage.

Cluster 3 (Blue): The Role of Gamification. The placement of this cluster as a fundamental role in connecting the way people travel with the environment through ecotourism and sustainable tourism. This cluster lies an opportunity in using gamification to engage and motivate tourist motivation and psychology toward more eco-friendly preferences.

Table 3. Cluster Analysis

Cluster	Item	Keyword
1	12	Adult, Article, Controlled study, Exercise Female, Human, Leisure, Male, Randomized controlled data Mental health, Mobile Applications, Physical activity
2	9	Augmented Reality, Cultural heritage, Education, Game-based learning Serious Games, Students, Tourism, Video Games, Virtual Reality
3	8	Ecotourism, Gamification, Mobile Phone, Motivation Psychology, Sustainability, Tourist behavior, Travel behavior

Source: VOSviewer Data Processing

From this analysis, combination between games and technology are identified as the promising concepts relating the usage of games in the educational domain with the understanding of human behavior through comprehensive investigation. The subjects of gamification and human factors suggest that these fields are among the most extensively studied and the emergence of sustainable tourism through well-being activities are now getting more attention from various tourists' segments.

Factorial Analysis

To undertake a more comprehensive investigation, an analysis was conducted utilising RStudio's factorial analysis function. In this mapping, keywords that occur frequently and are situated in close range suggest a more robust conceptual connection (see Fig. 8). The conceptual regions depicted on the map can be categorised as follows:

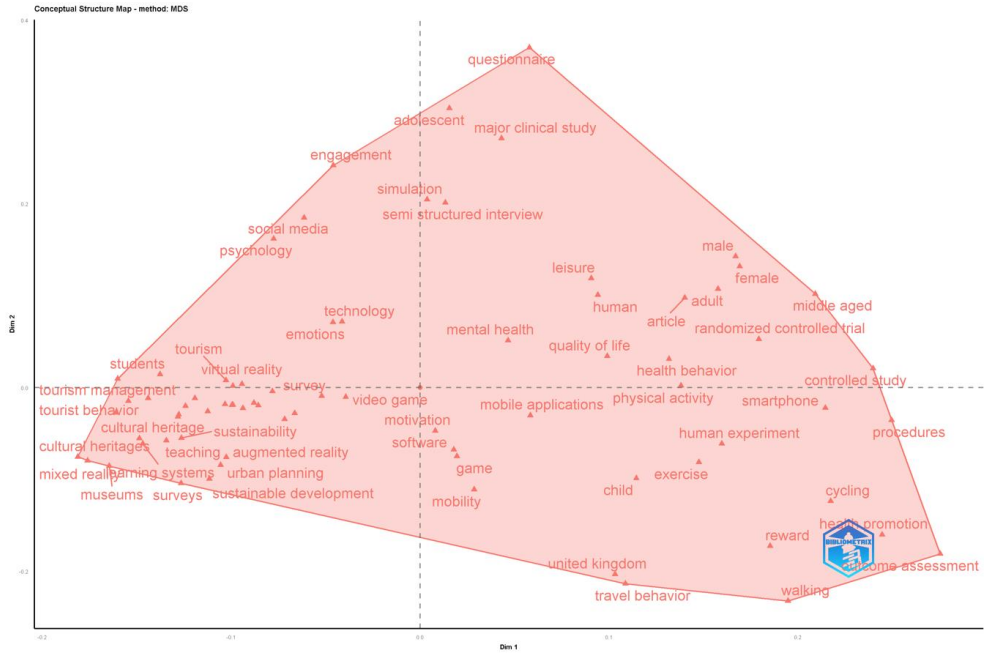


Figure 8. Multidimensional Analysis Map
Source: RStudio Data Processing

The analysis of this map differs from VOSviewer but aims to complement previous findings. The positioning of keywords according to dimensional or conceptual similarity offers a fundamental reference for further

investigation in this domain. The clusters displayed on the left highlight the socio-psychological effects of digital interactions and the benefits of using games with augmented reality (AR) for learning and sustainability. Concepts like smart tourism, ecotourism, gamification, and serious games underscore the close relationship between sustainability and technology. Conversely, the right side illustrates interventions in consumer behavior, including health promotion activities and exercises performed by research participants. It emphasizes measurable results and lifestyle changes that contribute to well-being in different study groups.

Technological advancements, such as smartphones and mobile applications, serve a pivotal role in bridging digital innovation with health-related outcomes. Human-technology interactions—encompassing the utilization of smartphones, apps, physical activity, and mental health—act as critical conduits that link experimental research with practical, real-world applications. Moreover, these technologies facilitate educational processes and support the systematic collection of clinical consumer data. The adoption of rigorous research methodologies further underscores the relevance of this domain in elucidating human behavior by connecting psychological motivations to physical health outcomes.

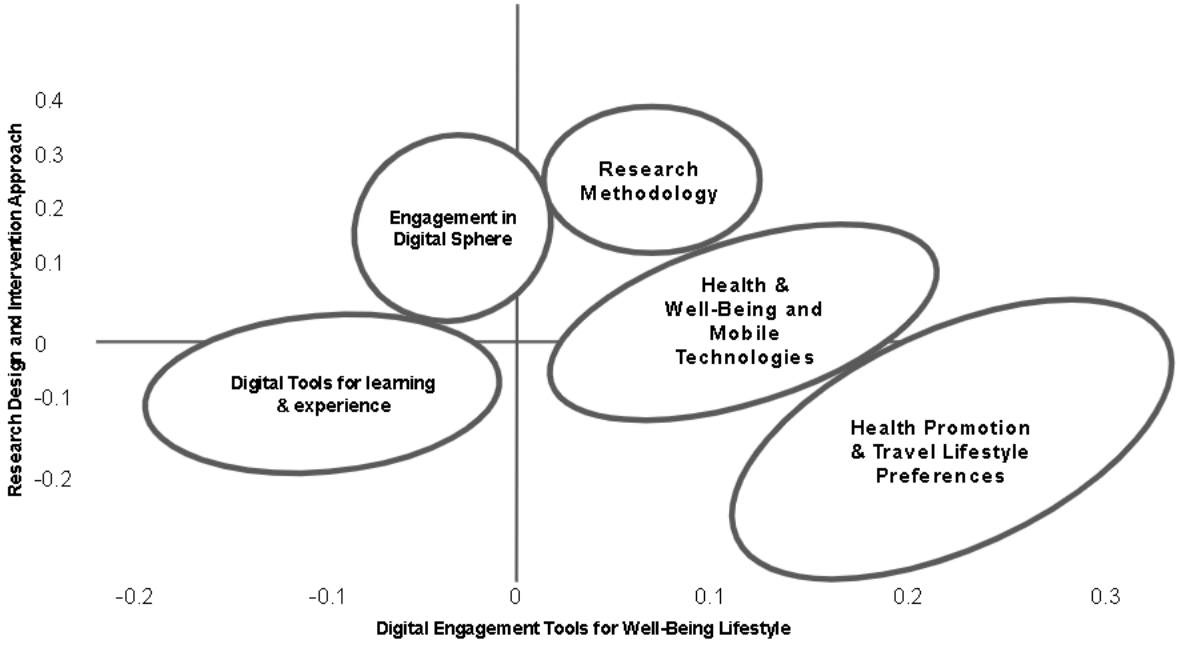


Figure 9. Thematic Clusters from MDS analysis
Source: Authors' own work

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As depicted in the figure, dimension 1 (horizontal) and dimension 2 (vertical) illustrate a conceptual framework of keywords that arise from two-dimensional mapping, highlighting semantic connections found in document analysis. Dimension 1 (horizontal) centers on games designed to promote learning and experience, especially those that use tools to address themes like heritage, sustainable development, urban planning, and digital-based games, and examines how technology fosters engagement.

Dimension 2 (vertical) describes the research methodologies used and the characteristics of sample respondents representing various segments of leisure activities. Technology's role in supporting health and well-being is a key theme, with the lower part of the map indicating its practical application and behavioral impact. Overall, the map

below emphasizes subjective experiences of game use, particularly interventions related to health and lifestyle.

Discussion

While citation metrics for gaming research continue to exhibit variability, the increasing volume of published articles suggests a growing scholarly interest in this domain. Research in this domain possesses substantial potential to advance both scholarly understanding and practical implementation. International funding agencies offering grants significantly influence research productivity, as demonstrated by the substantial number of publications originating from European nations such as Spain and the United Kingdom, as well as China in Asia. In the future, support from these funding agencies is expected to promote research interest beyond Europe, extending more comprehensively into Asian countries.

By referencing the factorial and co-occurrence analyses, it is apparent that the research focus is transitioning from a narrow emphasis on game design to a broader interdisciplinary investigation. The initial research scope, primarily focused on experimental psychology methodologies, is developing into a multidisciplinary platform for tackling worldwide sustainability issues. This can be seen by the predominant theme of gamification, which emerges as the most frequently occurring keyword with 101 appearances and also its level of interconnectedness at 142, indicating that it is a fundamental area of study across all research. Additionally, research dedicated to understanding the behavior of specific demographic groups is evident through search terms including randomised controlled trials and mental health studies focusing on adult populations. The utilization of digital platform applications such as augmented reality and virtual reality highlights the significance of digitalization in developing a comprehensive understanding of segment-specific activities.

Finally, the examination of game applications is characterised by the prominent utilization of gamification and serious games in tourism sector suggest that integrating games with immersive technology offers a significant opportunity for future development. This integration is anticipated to be implemented within a micro-spectrum (targeted tourist segments) while providing insights and solutions to broader issues namely cultural heritage, and sustainability through educational approaches that promote profound engagement (see Fig. 10).

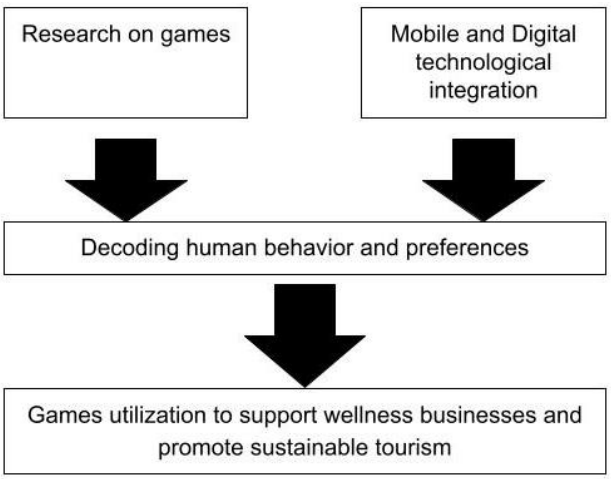


Figure 10. Interpreting the Map: Integrated Clusters Analysis
Source: Authors' own work

MANAGERIAL IMPLICATIONS

Based on this analysis and discussion, multiple recommendations arise. One main recommendation is for Asian institutions to contest the current European dominance by enhancing research funding for academics within Asia. This would facilitate localised investigation of the games industry, particularly in the areas of sustainability and tourism. Future investigations should focus on Augmented Reality (AR) and Serious Games, given that these areas presently achieve the highest citation impact (e.g., the UK with 441 citations).

In the long term, games should be regarded as a strategic instrument for capacity building and the enhancement of participant engagement. Within the scope of capacity building, games function as an investment in the development of human resources. They can be employed to enhance the comprehension of service standards and the administration of hospitality-focused destinations. Furthermore, games might improve destination competitiveness by promoting better results through stakeholder engagement. From the standpoint of tourists, games can be crafted to foster increased engagement and participation at the destination. This is essential for gathering comprehensive and accurate data concerning visitors, which facilitates market segmentation and the development of targeted programme interventions. Such data-driven strategies facilitate heightened engagement between tourists and the destination, eventually leading to an increased intention to visit.

The potential for future research directions becomes growing more important as tourist demographics evolve to technologically proficient segments. Research on gaming applications offers a valuable perspective for examining these behavioral changes and fostering a stronger connection between visitors and destinations. On the supply side, games offer a secure environment for destination stakeholders to develop their skills and enhance their capabilities. They enable local communities to enhance their creativity and problem-solving capabilities, providing a platform to develop decision-making skills within a simulated environment free of the risks associated with real-world failure.

Ultimately, the extensive body of research connecting games to health and wellness evaluations presents opportunities to create wellness tourism offerings. Integrating games into product development facilitates the creation of distinctive "refreshment" experiences, enabling tourists to transcend daily routines while fostering a profound, interactive connection with the brand or destination.

CONCLUSION

This study offers a comprehensive review of the development and conceptual framework of game-based research in the tourism industry over the past decade. The bibliometric analysis indicates a developing discipline that is progressing beyond its foundations in experimental psychology towards a comprehensive interdisciplinary framework. Document production trends demonstrate a steady increase, evolving from low levels in 2015 to an anticipated highest point in 2025. Although annual citation impacts have experienced volatility—most notably a significant decline in 2024—the rapid rebound in 2025 suggests ongoing scholarly engagement and the effective integration of gaming concepts with digital innovation within the tourism industry.

Geographically, the research landscape is predominantly influenced by European funding, with nations such as Spain and the United Kingdom exhibiting the highest development in documentation. This dominance demonstrates that centralised financial backing from institutions such as the FCT and the European Commission is essential in fostering scientific productivity. However, the increasing involvement of Asian countries, especially

China, indicates a potential future expansion of the field on a global scale. As funding sources become more diversified, the investigation of game applications is established as a crucial domain of research that will progressively integrate Western and Eastern academic viewpoints

Thematic analysis reveals that although "gamification" continues to be the most prevalent keyword, the most prominent conceptual associations are currently centred on physical activity and leisure, predominantly influenced by mobile technology. Understanding consumer segments continues to be the fundamental factor driving this evolution, as demonstrated by comprehensive efforts to analyse overall human behavior in the context of leisure activities. Organizations can utilise these insights to develop value-driven offerings for emerging markets, such as designing customised wellness tourism packages that incorporate game mechanisms to promote healthy behaviors and foster sustained engagement.

Finally, the study concludes that the future of the field resides in the domain of immersive technology—specifically employing serious games, Augmented Reality (AR), and Virtual Reality (VR) to foster profound engagement. The acceleration of digitalization through mobile applications functions as a catalyst, advancing games from the classroom to address complex challenges in cultural heritage and sustainable tourism. These tools provide optimistic micro-level solutions to macro-level global challenges, ensuring that the tourism industry remains resilient, innovative, and highly engaging for the upcoming generation of tourists.

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