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An approach to innovative eSports from a business perspective

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ABSTRACT

eSports, as a competitive activity related to the video game industry has attracted significant attention in recent years. Using co-citation analysis of references and authors, bibliographic coupling of sources, and author keyword co-occurrence analysis, this paper aims to carry out a bibliometric study using information extracted from the Web of Science database between 2010 and 2022 to provide an overview of the current knowledge structure of eSports and its evolution over time from a specific perspective related to Business, Management and Economic (BM&E) issues. This analysis reveals that the current body of literature focuses primarily on key aspects, such as defining eSports, differentiating them from traditional sports, and exploring their commercial potential within the entertainment industry. This study contributes to the advancement of knowledge related to the BM&E-eSports research field by providing information on the lack of theoretical foundations, current trends, and potential future research directions. The practical implications of this study can help both researchers identify the most relevant topics and key aspects in the BM&E-eSports research field and help business managers make appropriate decisions and design effective strategies to manage eSports organizations. Overall, this research lays the foundation for future studies that aim to understand the business potential of eSports and its impact on the market and society.

Introduction

The definition of eSports is still an open question. eSports refers to the activity of playing computer games against other people via information and communication technologies (Wagner, 2006) for money, to be watched by other people or to participate in special organized events to achieve a positive image within the eSports context. This definition fuels the debate on whether eSports must be considered real sports.

Although most of the scientific literature agrees that eSports should be considered a different form of sport (Parshakov & Zavertiaeva, 2018) facilitated by electronic systems (Hamari & Sjoblom, 2017), the recognition of eSports as real sports has not yet occurred, and eSports are not considered real sports (García & Murillo, 2020; Lorens, 2017). Some authors argue that eSports should not be considered sports in the strict sense because they do not contribute to the integral development of people, i.e., they lack the physical component (Jenny et al., 2017; Funk et al., 2018). However, several authors do not agree with this argument and state that sports are not just physical mastery competitions. To compete in eSports, players need to demonstrate gaming skills such as hand-eye coordination or speed action, as well as strategic and tactical knowledge, similar to other accepted sports such as football, basketball, or even other sport modalities such as poker or chess (Hallman & Giel, 2018; Summerley, 2019).

In the same vein, a significant body of scientific literature increasingly supports the idea that eSports should be recognized as real sports (Llorens, 2017; Jang & Byon, 2020; Tjonndal & Skauge, 2021), suggesting that eSports athletes develop similar psychological processes and cognitive abilities, such as perceptions, attention, mental skills, or creative thinking, as traditional athletes do. Moreover, eSports athletes face physical injuries and mental health risks comparable to those faced by traditional athletes (Bediou et al., 2018; García et al., 2018; Pedraza et al., 2020; Hong, 2022; Abremov et al., 2022).

In fact, eSports involves structured training sessions and competitive tournaments or leagues similar to traditional sports (Nagorsky & Wiemeyer, 2020). eSports require similar resources and adopt similar operating practices as traditional sports do, with similar commercialization and professionalization principles (Filchenko, 2018; Pu et al.,

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2021). Similar to traditional sports, eSports have players competing at a high level to win against their rivals (Jonasson & Thiborg, 2010; Wang et al., 2022) or wishing to win trophies, reputation or prices (Filchenko, 2018). The motivations of consumers are also quite similar between eSports and traditional sports (Chikish et al., 2019; Pu et al., 2021). These similarities have generated a very close relationship between the traditional sports industry and the eSports industry (Behnke et al., 2022; Postma et al., 2022A). For these reasons, some authors argue that the definition of sports should be changed to include the concept of eSports since they share fundamental characteristics such as competition, skill, sacrifice and dedication (McCutcheon et al., 2018).

The eSports industry is attracting the interest of many public and private entities (Dilek, 2019; Pumsanguan & Thithathan, 2022), as well as traditional sports organizations such as institutions, leagues or teams. These entities invest significant amounts of money to manage new teams, leagues and tournaments (Pizzo et al., 2018). For example, in 2021, the International Olympic Committee carried out a significant initiative launching the first Olympic virtual series just before the Tokyo Olympic games (Postma et al., 2022B).

Despite the explosive growth of the eSports industry in recent years (Himmelstein et al., 2017; Parshakov & Zavertiaeva, 2018; Meng et al., 2022) in terms of generated revenues and users' attention (García & Murillo, 2020; Parshakov et al., 2021), studies analyzing the leading trend of digitalization in the sports industry are lacking. Thus, while eSports has become a hot topic of research that has captured the attention of the scientific community (Huettermanm & Pizzo, 2022), the knowledge of this field is relatively limited compared with its great social impact (Funk, 2017; Bascón & Rodríguez, 2020) and potential future opportunities (Lefebvre et al., 2020).

Most previous studies on eSports have focused on sociocultural aspects, such as the motivations and behaviors of consumers and users (Watanabe et al., 2022). As a result, scientific studies focused specifically on strategic, management and business issues are lacking (Cunningham et al., 2018; Sliwa & Krzos, 2020; Flegr & Schmidt, 2022). This situation creates a black hole within scientific research that must be filled, especially considering the figures and implications of the eSports industry within the entertainment industry (Chikish et al., 2019), the great investment opportunities generated, and the enormous market expectations created among organizations, users and fans (Chaney et al., 2004; Lee & Schoenstedt, 2011; Saiz et al., 2021). Therefore, it is necessary to thoroughly study the knowledge structure of eSports from the points of view of business, management and economics (BM&E). This will help to better understand the relationships between eSports and market behaviors, as well as future opportunities for the development and growth of the eSports industry.

Through bibliometric analysis, a technique that is increasingly used due to internet-based technological advances (Roig-Tierno, et al., 2017), this article aims to identify the foundations and current knowledge of eSports from the BM&E perspective. This type of analysis provides a comprehensive overview of the scientific structure of a research field in a quick and easy way. In this study, co-citation of authors and references, bibliographic coupling of sources, and co-occurrence of author keywords methodologies were used for publications related to eSports published between 2010 and 2022 included in the Web of Science database. This research provides the first overview of the knowledge structure of eSports from the perspective of BM&E, highlighting the lack of a theoretical basis, the most relevant results already obtained, and current trends and future lines of research.

The rest of the paper is structured as follows. The first section includes the literature review of the paper, the second section describes the data and methodology used, the third section presents and discusses the results obtained, and the fourth section concludes and suggests future lines of research.

Literature review

eSports definition

Although several eSports definitions exist within the academic and nonacademic fields (McCutcheon et al., 2018), there is no consensus around them (Jenny et al., 2017). The name itself is different from one study to another. 'eSports', 'eSport', 'e-sports', 'e-sport', 'electronic sports' and 'cybersports' have been identified in the literature, demonstrating the diversity of the concept.

Most of the definitions relate to aspects as different as culture, technology, intelligence or sports (Lu et al., 2022). Considering the mix of sports and technology, Wagner (2006) defined eSports as '...an area of sport activities in which people develop and train mental or physical abilities in the use of information and communication technologies...' (p. 3). This definition was one of the first and one of the most commonly accepted. Years later, Taylor (2012) defined eSports as a form of organized competition that involves high-level players in virtual environments that share similarities with traditional sports in terms of competitiveness and dedication. One of the most widely accepted recent definitions of eSports among the scientific community that continues to be a reference for understanding their meaning is the one provided by Hamari and Sjoblom (2017), who define eSports as '...a form of sports where the primary aspects of the sport are facilitated by electronic systems; the input of players and teams as well as the output of the eSports system are mediated by human−computer interfaces...' (p. 5). Many authors agree that eSports is a popular and cultural way of playing and watching digital games (Hamilton et al., 2012) and is the result of the organized professionalization of competitive gaming (Witkowski, 2012; Antón & García, 2014). More recently, Funk, Pizzo and Baker (2018) described eSports as organized and competitive videogaming events where professional players or teams compete against each other in different multiplayer games (such as fighting, shooters, real-time strategies, multiplayer online battle arenas, and virtual sport games) that can be played individually or as part of a team.

In the eSports environment, players (pro- or amateurs, depending on the competition) try to maximize their skills and compete to achieve specific goals, using consoles, computers or mobile phones (Hamari & Keronen, 2017; Jenny et al., 2017; Abremov et al., 2022). In this way, eSports can attract a substantial audience of spectators both in person and by streaming platforms. Therefore, eSports can be understood as an entirely new category of digital competition with intelligent and advanced machines (Kugler, 2022) that constitute an ecosystem where many related leisure, media, and entertainment industries converge (Wong & Meng-Lewis, 2022). However, on the basis of the points of agreement of the previous definitions, we can define eSports as a form of a competitive electronic game with significant popularity and worldwide recognition that takes place in virtual environments and combines elements of strategic gameplay, skillful execution, technological advances and structured competition. In addition, like other sport modalities, eSports is not a homogeneous set; it covers different subcategories (the same way basketball and curling are two different sports).

eSports versus videogaming

Videogames have evolved over the decades along with the technology sector, transitioning from individual or personal entertainment to a product capable of offering greater interaction options between users with the advance of digital convergence (Scolari, 2013). Specifically, with the rise of the internet and online connectivity in the early 2000s, informal communities of video game enthusiasts began with clan tournaments and LAN parties (Steinkuehler, 2020). In 2011, the company that created the video game 'League of Legends', Riot games, organized the first world championship

tournament of this video game, with high monetary prizes and a global following of millions of viewers that has only grown annually. This is not only the birth of one of the first major global eSports competitions but also one of the most important milestones to explain the transition from video games to electronics sports (Martín-Múñoz & Pedrero-Esteban, 2019).

Importantly, eSports refers to the world of competitive gaming but not to the entire video game industry. In fact, according to Bacón & Rodríguez (2020), '. . .although all eSports come from videogaming, not all the videogames can turn to the eSports. . .' (p. 342). Although eSports and videogaming share the same environments and eSports as a global phenomenon would not have been possible without the internet and other technologies previously used in the videogaming industry (Werder, 2022; Seo, 2016), there are clear differences between them (Bialecki et al., 2022). Unlike videogaming, eSports require organization, structure, competition and a complex ecosystem of actors (Funk et al., 2018).

There are also differences between them from the point of view of the players, supporters, tournaments, or structures. In fact, one of the greatest differences relates to the structure and organization level, since eSports requires the establishment of a professional organization with the creation of leagues, tournaments and a complex ecosystem of actors (Werder, 2022). In addition, although traditional video games can also have multiplayer components, they are focused on providing entertainment and fun without the same level of formalized competition and structured events (Hallman & Giel, 2018) as eSports does. This difference is also reflected in the type of players for each option. While eSports gathers more 'professional' players focused on training and playing at highly competitive levels, traditional video games gather 'recreational' players more focused on enjoying the game without showing high levels of commitment (Bányai et al., 2018). In conclusion, while traditional video games focus on fun and entertainment, eSports create a professional and competitive environment, placing a strong emphasis on structure and organization.

However, the videogaming industry has evolved into a massive global business, and within this industry, eSports has emerged as a revolutionizing force, creating a growing market that incorporates network capabilities and the ability to play against others (Filchenko, 2018; Saiz et al., 2021).

The growth of the eSports industry

eSports is experiencing considerable growth and showing great economic and social potential. It is also one of the most self-organized and unregulated sectors in terms of revenue-sharing and competitive-balance rules, as it does not yet have a standardized governance structure. While the scientific literature on the motivations for the consumption of traditional sports is wide, previous research on the motivations that lead to the consumption of eSports is still scarce (Rogers et al., 2020). Despite this low level of scientific attention, eSports continues to be a recent growing phenomenon that is increasingly capturing global attention (Zagala & Strzelecki, 2019) and that demands changes in their management practices (Brown et al., 2018; Pizzo et al., 2018).

According to Sliwa and Krzos (2020), eSports represents one of the most profound evolutionary movements within the sports industry in the XXI century, principally due to the development of technological advances and the acceleration of digitalization processes. However, the rapid changes in the eSports landscape and the growing commitment and passion shown by players and fans can be a double-edged sword that can lead this sector to great success or failure in the near future. In other words, the success or failure of the eSports industry will depend on the behaviors of both endemic and nonendemic actors (companies and individuals directly or indirectly related to the sector, respectively), who can justify very positive or negative results (Freitas et al., 2020; Lefebvre et al., 2020). Positive practices such as supporting sustainable growth or prioritizing the well-being of players and fans may contribute to the success of the eSports industry in the long term. However, negative practices such as using inappropriate advertising or showing negative behaviors with competitors or fans may undermine the integrity of the industry and its future growth.

The growth of eSports is intrinsically linked to the internet and other technological advancements. However, it is still a complex digital phenomenon (Aghey, 2020; Wong & Meng-Lewis, 2022) with great potential to be exploited (the same as other forms of traditional sports) and there is much work to do (Parshakov et al., 2021). For example, revenues have multiplied six-fold in the 2010s (2Playbook, 2021), namely, they have increased from $700 million in 2017 to $1.000 million in 2021 (with an estimation of $1.800 million in 2025) (Chiva et al., 2018; Sjöblom et al., 2019; Newzoo, 2022). The number of audience figures has also greatly increased in recent years, from 70 million people watching eSports in 2013 to 385 million in 2017 and 474 million in 2021 (with an estimated 640 million in 2025). This remarkable growth of the eSports landscape, driven by the accessibility and increasing attention of new followers, increased after the COVID-19 pandemic (Crone, 2022), which accelerated the transformation and solidification of a dynamic industry with high potential for innovation opportunities and challenges. eSports have gone from being a small number of competitions or tournaments run by a few recreational participants to being to a fully professionalized multibillion dollar industry (Hedlund, 2021). In fact, this accelerated development, with an increasing number of professional teams and players competing to win large prizes, has led to the consideration of eSports as a profession (Smith et al., 2019; Giakoni et al., 2022). The spectacular growth of the eSports industry has captured the interest of many public and private organizations (Dilek, 2019; Pumsanguan & Thithathan, 2022), as well as other traditional sport organizations (institutions, sport leagues, sport teams, etc.) that are investing large amounts of money to manage new teams, leagues and tournaments attracted by a potentially lucrative market sector with high media visibility (Pizzo et al., 2018; Pizzo et al., 2019). eSports is powered by fans who can watch and participate via digital technologies and support gamers similar to athletes, who, in turn, must be motivated to regularly train and develop their skills to compete at live events or through live streaming (Pedraza et al., 2020; Robertson, 2021). This generates a large and growing audience (particularly young people), along with a large and growing economic impact (Marques, 2019; García & Murillo, 2020; Saiz et al., 2021). In sum, eSports has become a new form of entertainment close to technological advances that follow the rules and regulations established by organized leagues and tournaments with ranking systems and prizes (Taylor, 2018; Chan et al., 2022) and with its own financial and cultural practices capable of generating multiple challenges and opportunities. The eSports industry is not a passing craze and will continue to change and grow in the near future, affecting companies, investors and people (López-Cabarcos et al., 2020b).

eSports research field

The concept of eSports has captured the attention of the scientific community in recent years (Huettermann & Pizzo, 2022), and for this reason, the literature concerning this topic is still scarce and scattered (Hamari & Sjoblom, 2017). Moreover, eSports have been studied from very different perspectives (Hallman & Giel, 2018), such as business management, addressing topics such as consumer needs, tourism opportunities, marketing strategies or brand value (Weiss & Schiele, 2013; Alkier & Demirkiran, 2019; Rokosny, 2019); tech-computing, addressing topics such as game structures for matchmaking, systems to ensure fans' enjoyment, or match-fixing analysis (Myslak & Deja, 2015; Charleer et al., 2018; Yan, 2018); psychology, addressing topics

such as lifestyle behaviors among young people or changes in psychological profiles during competitions (Chan et al., 2022; Mateo et al., 2022); and gender, addressing topics such as women's participation in the industry (Ruvalcaba et al., 2018; Darvin et al., 2021; Yusoff & Yunus, 2021; Yu et al., 2022).

Some of the reasons for this wide range of perspectives around eSports are the lack of consensus on their definition, the uncertainty surrounding the 'eSports phenomenon', and the almost nonexistent legal and regulatory framework. These factors make eSports a blank canvas for researchers to explore.

The few bibliometric studies carried out to date have attempted to establish the theoretical foundations of eSports research from a generic perspective (Bascón & Rodríguez, 2020; Chiu et al., 2021). Furthermore, this research aims to understand the business and management implications of the eSports industry and to assess the current theoretical foundations of eSports from this perspective.

As already mentioned, previous research has focused on the sociocultural factors influencing the eSports industry, as well as the motivations and behaviors of consumers and participants (Watanabe et al., 2022); however, the BM&E issues surrounding the eSports industry remain relatively unexplored, and a comprehensive and detailed analysis of them is lacking (Cunningham et al., 2018; Sliwa & Krzos, 2020; Flegr & Schmidt, 2022). Specifically, this issue represents a black hole within the existing scientific research that needs to be filled, mainly considering the figures related to the growth of the eSports industry (Chikish et al., 2019) and the new good opportunities it presents in the future (Chaney et al., 2004; Lee & Schoenstedt, 2011; Saiz et al., 2021). Therefore, eSports remains a relatively new phenomenon with significant growth potential that, however, must face many challenges similar to those that traditional sports faced in the past (Funk et al., 2018). For this reason, sport managers must give attention to how eSports must be managed, facilitating achievements, avoiding mistakes and promoting a culture based on innovation and value creation (Hallman and Giel, 2018).

BM&E is clearly a crucial perspective to be considered within the field of eSports. As such, it is necessary to carry out an in-depth analysis of its fundamentals and knowledge structure. It can help to better understand the behavior of the eSports industry within the business context; that is, it can better explain how to promote the development and growth of the eSports industry from a BM&E perspective.

Method

Bibliometric analysis

A bibliometric study is an appropriate method for establishing the knowledge structure of a research field. A bibliometric study implies '...the application of mathematics and statistical methods to books and other media of communication...' (Pritchard, 1969; p. 349). In other words, this type of study provides an objective view of a specific research field and a synthesis of previous related research results (Zupic & Čater, 2015). They are based on advanced analyses of publications and citation data (Van Raan, 1996) and use that information to obtain a better view of the actors, sources and other information involved in a particular research field (Verbeek et al., 2002).

Bibliometric analysis involves the use of two techniques: first, the analysis of bibliometric performance indicators, which illustrates the performance of authors, journals, institutions, or countries; and second, scientific mapping, which allows networks to be built between keywords, authors, journals, institutions or countries and to be visualized graphically. All this information allows us to detect the most important research topics within the scientific field under study (Ellegaard & Wallin, 2015) and, more importantly, the emerging trends and future lines of research (Gao et al., 2018). Bibliometric research has experienced important growth in recent decades, contributing to the advancement of theoretical and practical knowledge (Mukherjee et al., 2022). Currently, it is a scientific specialty and an integral part of research evaluation methodology.

Dataset configuration

The Web of Science (WoS) database has been used to search for scientific research related to eSports to be included in bibliometric studies. This database, which includes the highest-quality scientific research, has also been used in previous bibliometric studies (Moraga, 2014; Khan et al., 2022).

A search was performed for publications containing the terms 'eSports', 'eSport', 'e-sports', 'e-sport', 'electronic sports' and 'cybersports'. In addition to articles, other scientific documents, such as books, book chapters, editorials or proceedings papers, were considered in the study. Furthermore, the year of publication, scientific study field or language used were not limited when the search was performed.

The search, carried out in December 2022, resulted in the selection of 781 documents published from 2005 to 2022. All the metadata available from these documents were downloaded, specifically the title, abstract, keywords, information about the authors and references cited in each publication. In summary, most of the documents selected were articles (more than 65 %), included in 482 sources, authored by 1,776 researchers from 70 countries and 863 organizations, mostly written in English (90 %), with the USA as the most frequent country of origin and 217 citations in WoS.

Table 1 shows the top ten research areas around eSports included in WoS. Among them, the category 'BM&E' has been chosen in this bibliometric study because of i) its great importance and implications in the field of eSports research; ii) the growing number of publications included in this category; and iii) the lack of a theoretical structure for scientific research on electronic sports specifically focused on BM&E-related topics. Therefore, the initial search was refined, filtering only publications related to BM&E within eSports. In summary, the results include 78 publications (mostly articles in journals) published between 2010 and 2022, authored by 170 researchers from 125 organizations and 31 countries, mostly written in English, with 67 citations in the WoS database. To process and analyze the data, VOSviewer 1.6.18 was used.

Methodology

Three bibliometric techniques were used in this study: co-citation analysis, bibliographic coupling and co-occurrence. Cocitation analysis allows researchers to compare the frequency at which two publications have been referenced together, providing insights into their subject similarity and facilitating the identification of shared interests (Small, 1973; Üsdiken & Pasadeos, 1995; Lievrouw, 1989; Zupic & Čater, 2015). This analysis reveals the basis upon which these publications are built (López-Cabarcos et al., 2020a).

Table 1
WoS research areas within the eSports research field.

WoS research areas	Number of records	% of 781
Computer science	159	20.359 %
Social sciences other topics	155	19.846 %
Psychology	94	12.036 %
Sport sciences	89	11.396 %
Communication	81	10.371 %
Business-management and economics	78	9.987 %
Engineering	47	6.018 %
Government law	47	6.018 %
Education educational research	35	4.481 %
Cultural studies	31	3.969 %

Bibliographic coupling analysis can serve multiple purposes within the study of a specific research field; for example, in this study, it is employed to identify the sources that publish documents with similar research approaches (Peters et al., 1995; Jarneving, 2007). Bibliographic coupling differs from co-citation analysis since it examines the overlap in bibliographies rather than the frequency of citations between two documents. (Zupic & Čater, 2015; Kovács et al., 2015). Moreover, these two analyses are complementary (Jarneving 2007). While co-citation analysis helps in mapping the research foundations of the topic under study, bibliographic coupling reveals current and future trends in a specific research field (Zupic & Čater, 2015; Kovács et al., 2015; López-Cabarcos et al., 2020a).

The analysis of author keyword co-occurrence provides valuable insights into the core of the study field, the main topics under study, and their evolution over time. (Callon et al., 1983; Su & Lee, 2010; Zupic & Čater, 2015) to contribute to a better understanding of the research trends within the field under study (Li et al., 2009; Zhang et al., 2016). VOSviewer provides a visual outline of the relationships among authors, publications, journals and keywords. (Van Eck & Waltman, 2010). Although this software has been used in other bibliometric analyses related to business and management (Mingers & Leydesdorff, 2015), it has never been applied to the analysis of this perspective within eSports.

Results and discussion

The main results of the bibliometric analysis related to BM&E-eSports are shown below. Figs. 1 and Fig. 2 show the number of publications and citations obtained per year in this category, respectively. The first article on this topic dates from 2010. Until 2018, very few papers were published; however, from 2018, this research topic clearly captured the attention of researchers, who oversaw significant growth in the number of papers published, especially during the pandemic years of 2020 and 2021. It is expected that the number will continue growing strongly during the following years.

The citation analysis yields similar results, with a significant increase in the number of citations from 2018, which was even greater in 2019, 2020 and 2021. Everything indicates that the same trend will be maintained during the following years. All these results corroborate the fact that this topic is capturing enormous and growing attention from the scientific community.

Table 2 presents the ten main WoS categories within the BM&E-eSports sample. As expected, the most important categories are (in this order) 'management', 'businesses', and 'economics. It is also relevant to the fourth category in the list, 'hospitality, leisure, sport tourism', with 22 publications, which shows the strong linkages between eSports and other related industries, such as hospitality, leisure, and tourism. A good example of this is the study by Thompson, Taheri and Scheuring (2022), which precisely highlights the potential of eSports to become a powerful tourism subsector in the future. The remaining categories in the list include a much smaller number of publications.

Table 3 includes the most cited documents within the BM&E-eSports sample. The most cited paper is 'What is eSports and why do people watch it' by Hamari and Sjoblom (2017). This article delves into the eSports concept and explains its evolution to understand this industry from an entertainment perspective. The authors also discuss the consideration of eSports as real sports, identifying the differences and similarities between them. In addition, the authors explain the main reasons and motivations for consuming this type of entertainment, concluding that competitiveness is one of the most important. This article is cited more than twice the number of times as the next article in the list, making it one of the most important for understanding the fundamentals of the eSports research field.

The second most cited paper is 'eSports – Competitive sports or recreational activity?' by Hallmann and Giel (2018). This paper also focuses on the differences between eSports and traditional sports, reflecting the differences between them. In this case, the authors do not consider eSports as real sports but highlight their potential to be real sports in the future. The authors also explain the great potential of eSports in the future from business, economic and market perspectives. The third most cited publication is the paper titled 'eSport management: Embracing eSport and research opportunities' by Funk, Pizzo and Baker (2018). The authors also discuss the consideration of eSports as real sports. Specifically, and on the basis of previous experience related to traditional sports, the authors analyze the structure, organization and management of eSports events, justifying the implications and consequences of their enormous growth.

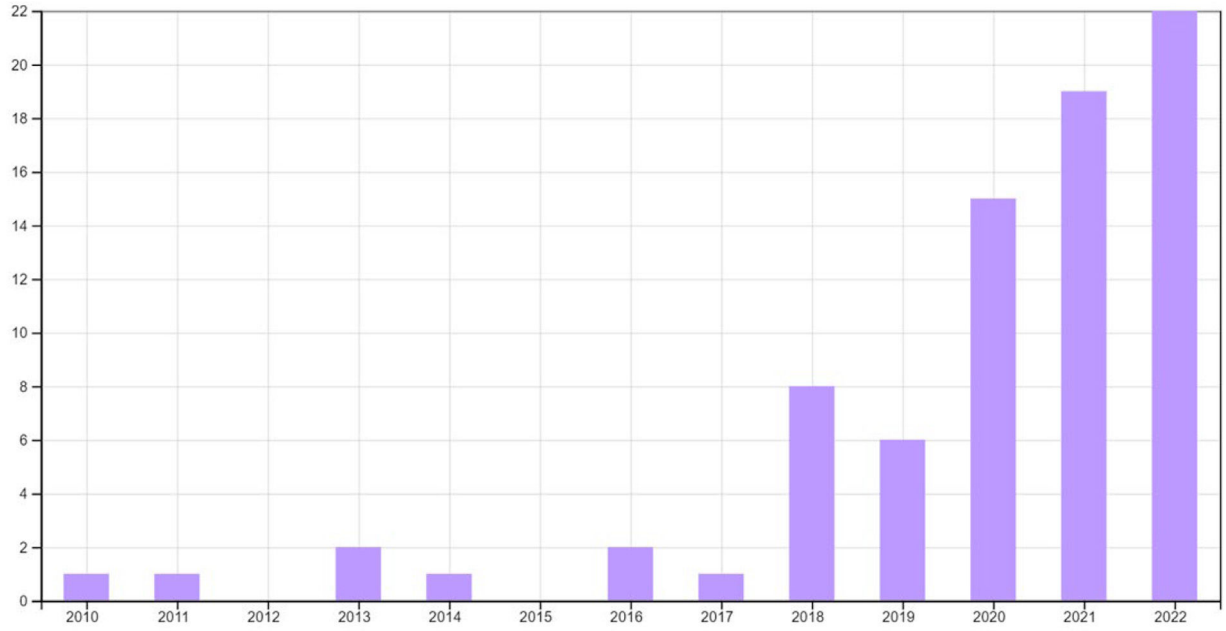

Fig. 1. Number of articles published per year within the BM&E-eSports category.Source: WoS Database. Recovered December 31, 2022.

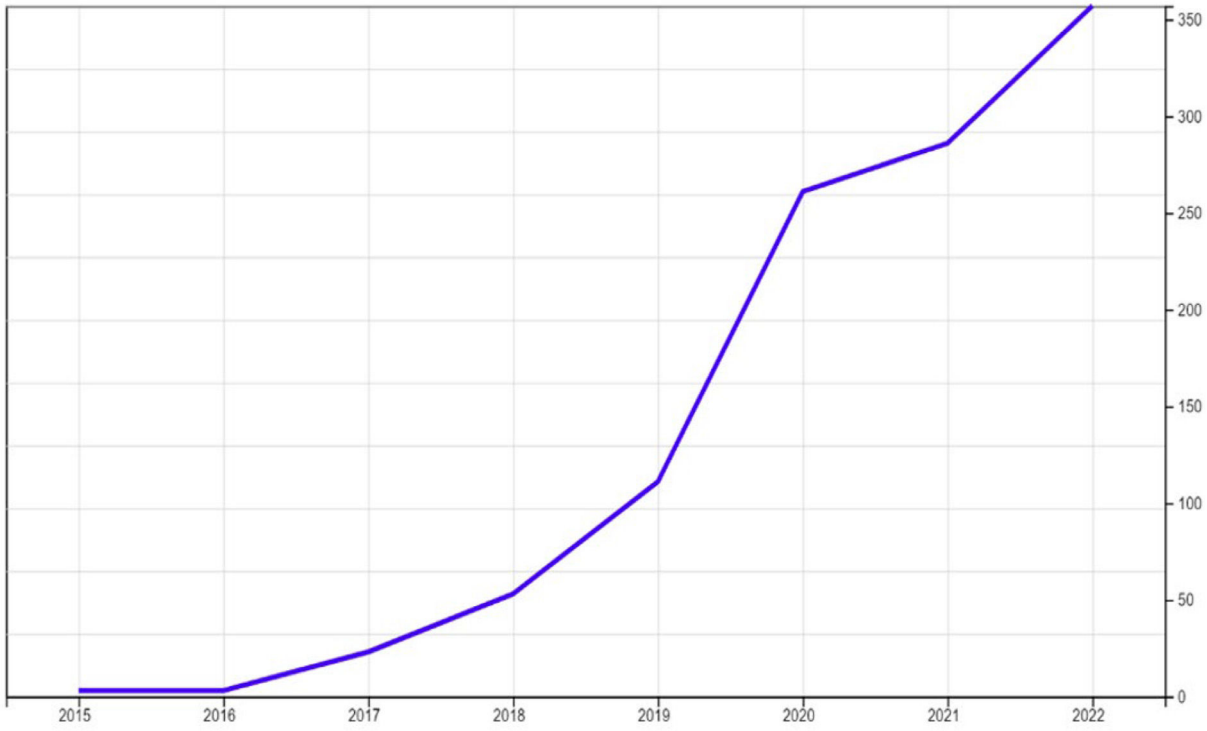

Fig. 2. Number of citations per year within BM&E-eSports cate.Source: WoS Database. Recovered December 31, 2022.

Table 2
WoS categories within the BM&E-eSports research field.

WoS Categories	Number of records	% of 78(*)
Management	32	41,026 %
Business	26	33,333 %
Economics	24	30,769 %
Hospitality, leisure, sport tourism	22	28,205 %
Sport sciences	4	5,128 %
Business finance	3	3,846 %
Computer science information systems	3	3,846 %
Operations research management science	3	3,846 %
Communication	2	2,564 %
Cultural studies	2	2,564 %

(*) The sum of the percentages is greater than 100 % because an item can belong to several categories.

The rest of the publications in the list share a common perspective, which is to justify the similarities and differences between eSports and traditional sports, justifying the business and economic potential of eSports mainly from the consumer behavior point of view. Furthermore, papers placed in the fourth and eighth positions analyze how both cooperation and competitiveness can attract viewers and competitors. These papers also analyze how professional players can differentiate between those tasks related to work and those related to leisure. Papers placed in fifth and tenth positions aim to justify and make understandable the needs and behaviors of consumers, identifying the differences between the consumer patterns within eSports and traditional sports to predict consumer behaviors. The paper ranked in the sixth position addresses management issues related to the eSports industry, specifically those related to the marketing and business fields. The paper placed in the seventh position deepens the concept of 'sportification', analyzing the positive and negative effects of eSports together with the most important management strategies to be used within this industry. Finally, the papers ranked ninth position address the evolution of the eSports industry and its amazing growth during the pandemic years 2020 and 2021.

Co-citation analysis of references and authors

Table 4 includes the top ten results for the co-citation analysis of references and authors. The most cited paper is the one previously mentioned 'What is eSports and why do people watch it?' by Hamari

Table 3
Most cited papers within the BM&E-eSports research field.

Article	Author	Citation
What is eSports and why do people watch it?	Hamari and Sjoblom (2017)	295
eSports - Competitive sports or recreational activity?	Hallmann and Giel (2018)	120
eSport management: Embracing eSport education and research opportunities	Funk; Pizzo and Baker (2018)	108
Professionalized consumption and identity transformations in the field of eSports	Seo (2016)	81
eSport vs. Sport: A Comparison of Spectator Motives	Pizzo; Baker; Na; Lee; Kim and Funk (2018)	68
eSport: Construct specifications and implications for sport management	Cunningham; Fairley; Ferkins; Kerwin; Lock; Shaw and Wicker (2018)	68
Embracing the sportification of society: Defining e-sports through a polymorphic view on sport	Heere (2018)	57
Virtual worlds in competitive contexts: Analyzing eSports consumer needs	Weiss and Schiele (2013)	52
All that glitters is not gold. The rise of gaming in the COVID-19 pandemic	Lopez-Cabarcos; Ribeiro-Soriano and Pineiro-Chousa (2020)	33
The effects of consumer esports videogame engagement on consumption behaviors	Abbasi; Asif; Hollebeek; Ul Islam; Ting & Rehman	23

Table 4
Cocitation analysis of authors and references.

Authors	Citation	Link Strength	References	Authors	Citation	Link Strength
Seo	48	272	What is eSports and why do people watch it?	Hamari and Sjoblom (2017)	26	80
Hamari	44	279	eSport management: Embracing eSport education and research opportunities	Funk, Pizzo and Baker (2018)	20	66
Funk	34	172	Electronic sports: A new marketing landscape of the experience economy	Seo (2013)	20	61
Taylor	27	152	Professionalized consumption and identity transformations in the field of eSports	Seo (2016)	16	66
Pizzo	24	117	eSports - Competitive sports or recreational activity?	Hallmann and Giel (2018)	14	47
Hollebeek	23	121	Virtual(ly) Athletes: Where eSports fit within the definition of "sport"	Jenny et al. (2017)	14	47
Parshakov	23	118	On the scientific Relevance of eSports	Wagner (2006)	13	58
Jenny	21	157	eSport vs sport: A comparison of spectator motives	Pizzo et al. (2018)	11	36
Holden	21	93	On the digital playing field: how we ``do sport'' with networked computer games	Witkowski (2012)	10	44
Sjoblom	15	148	It is in the game: dimensions of esports online spectator motivation and development of a scale	Yizhou et al. (2019)	9	30

and Sjoblom (2017), which is a fundamental and introductory paper that addresses the eSports definition and powerful reasons, such as competitiveness, that justify the attraction of an increasing number of consumers.

'eSport management: Embracing eSport education and research opportunities' by Funk, Pizzo and Baker (2018) is the second paper in the ranking. This article is the first on the list that addresses eSports from a management perspective. Specifically, it addresses the most effective strategies that managers can use to manage eSports events and the importance of taking advantage of previous experience managing traditional sports. To this end, the paper begins by discussing the consideration of eSports as real sports.

The paper 'A new marketing landscape of the experience economy' by Seo (2013) placed in the third position analyzes the users' consumption of eSports from a marketing perspective, as well as the different roles played by the stakeholders related to this industry. It also analyzes how the collaboration among companies, players, communities and other stakeholders is a key issue for the growth and economic development of the eSports industry.

'Professionalized consumption and identity transformations in the field of eSports' by Seo (2016) is the fourth paper in the rank. This paper examines consumers' behaviors and eSports from a professionalized perspective. Specifically, it analyses the process by which eSports consumers 'professionalize' the leisure perspective involved in the video game activity.

The fifth most cited paper is 'eSports - Competitive sports or recreational activity?' by Hallman and Giel (2018), which addresses, in addition to the analysis of the differences and similarities between eSports and traditional sports, the enormous commercial potential of eSports.

The paper 'Virtual(ly) Athletes: Where eSports fit within the definition of sport' by Jenny, Douglas, Keiper and Olrich (2017) is ranked in the sixth position. Its year of publication justifies that this paper also tries to conclude whether eSports are real sports from philosophical, sociological and academic perspectives, analyzing in depth the reasons that have led to their rapid growth.

The seventh ranked paper is 'The scientific relevance of eSports' by Wagner (2006). This is one of the first and most important publications in the eSports research field since it addresses the study of eSports from a scientific point of view, including an overview of eSports history and a set of the most accepted eSports definitions.

In eighth position is 'eSport vs sport: A comparison of spectator motives published' by Pizzo, Baker, Na, Lee, Kim and Funk (2018). This paper aims to shed light on the relationship between eSports and traditional sports, the similarities and differences between the management and commercial strategies applied to them, and the reasons that lead eSports fans to consume this type of entertainment.

In ninth position is the article 'On the digital playing field: How we 'do sport' with networked computer games' by Witkowski (2012). This paper, one of the first published in the eSports research field, helps lay its foundations, discussing the consideration of eSports as real sports from different perspectives. This paper also analyses how new technologies are a fundamental driver of the eSports industry.

Finally, the paper by Yizhou, Junqi, Zhang and Lu (2019) placed in the tenth position, 'It is in the game: Dimensions of esports online spectator motivation and development of a scale', is focused on the eSports audience; that is, in their consumption habits and motivations to consume electronic sports.

The link strength measures the strength of the link between the articles; thus, it expresses the strength of the link between an element and the rest in a co-citation network, representing how many times the same authors or publications appear together in scientific publications. It is useful for identifying related research areas and those authors or papers that are closely related within the scientific literature, confirming the mutual influence between documents and authors. The results show that the paper with the highest link strength is that by Hamari and Sjoblom (2017) (link strength=80), which is very distant from the rest of the papers. The second position is for the paper by Seo (2016), which shows a better link strength (link strength=66) than his 2013 paper ranked fourth (link strength=61). The third position is for the paper by Funk, Pizzo and Baker (2018), with a link strength of 66. The fifth position is for the paper by Wagner (link strength=58). The rest of the papers in the list are located at a considerable distance from the previous ones; thus, the papers by Hallman and Giel (2018) and Jenny, Douglas, Keiper and Olrich (2017) both have a link strength of 47. The paper by Witkowski (2012) has a link strength=44; the paper by Pizzo, Baker, Na, Lee, Kim and Funk (2018) has a link strength=36; and finally, the paper by Yizhou, Junqi, Zhang and Lu (2019) has the lowest link strength (link strength=30).

The results of the co-citation analysis of authors reveal the most cited authors in the eSports research field. Six of the ten authors in the list have published at least one of the top ten publications derived from the co-citation analysis of references. The first author is Seo, who has published two of the top five most cited publications. In the second and tenth positions are Hamari & Sjoblom, the authors of the most cited publication (What is eSports and why do people watch it?). The third and fifth positions are for Funk & Pizzo, and the eighth position is for Jenny. The fourth, sixth, seventh and ninth positions are for Taylor, Hollebeek, Parshakov and Holden, respectively, whose publications are not included within the top ten publications derived from the co-citation analysis of references.

According to the link strength values, Hamari is the number one (link strength=279). Seo is placed in the second position of the list (link strength=272). The third position is the Funk paper with a link strength of 172. Jenny is ranked fourth (link strength=157) closely, followed by Taylor, which is placed in the fifth position (link

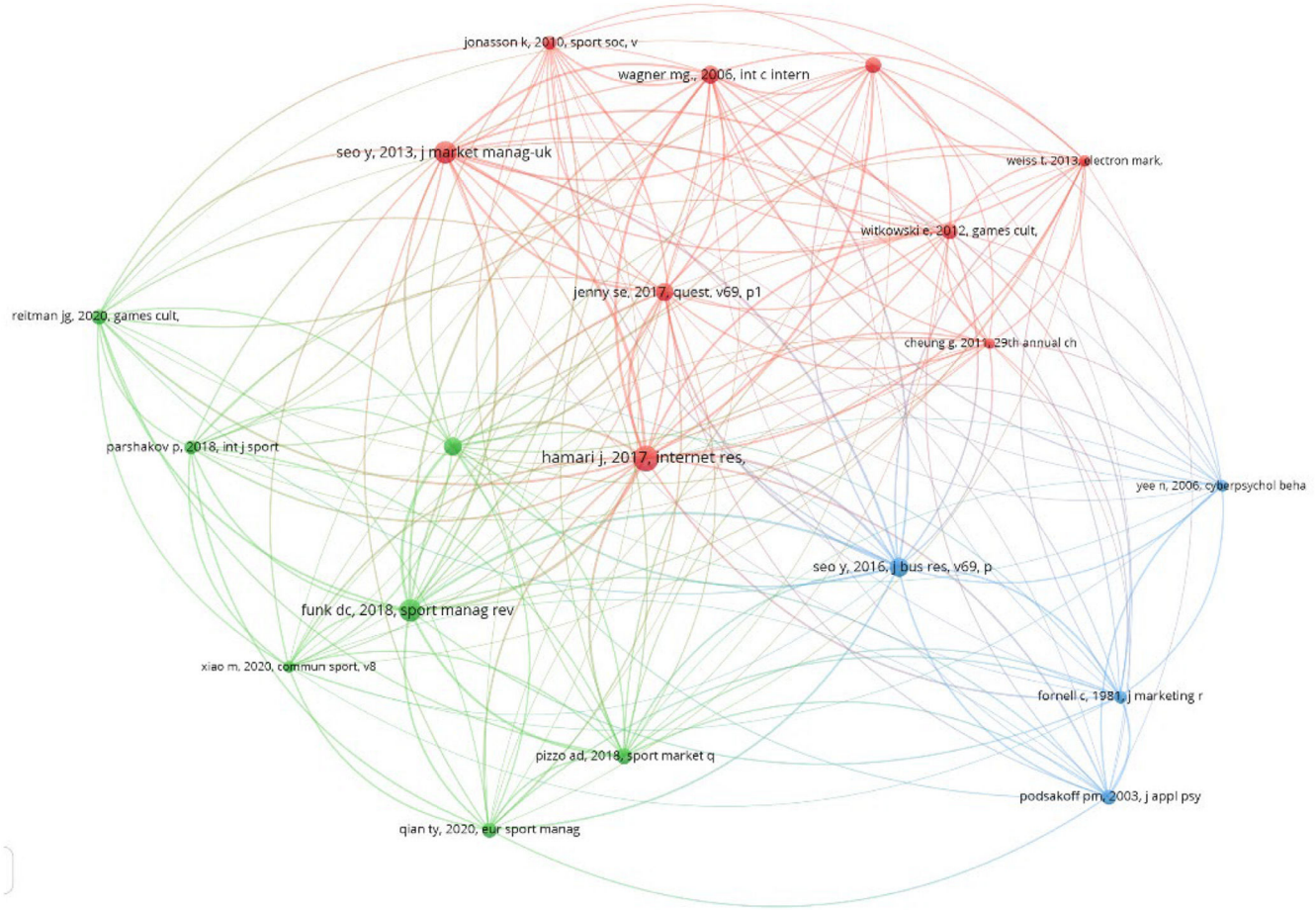

Fig. 3. Cocitation analysis of references.

strength=172). Sjoblom advances from the tenth to sixth position with a link strength of 148. Hollebeek is placed in the seventh position (link strength=121). Parshakov is placed in the eighth position (link strength=118) very close to Pizzo, which is placed in the ninth position (link strength=117). Finally, Holden with a link strength of 98 is placed in the tenth position.

Fig. 3 shows the results of the co-citation analysis of the references. A label represents each reference, and the font size indicates the number of times the reference is cited in the database. Thus, a larger size means more citations. The distance between references indicates the probability that they are cited together. Thus, a shorter distance means a higher probability of being cited together. The colors are related to the different clusters of cited references derived from the analysis. In this way, those references belonging to the same cluster are more likely to be cited together.

Three different clusters can be identified. The red cluster includes the main publications that help establish the fundamentals of the eSports research field, addressing topics such as the consideration of eSports as real sports, their advantages and disadvantages for organizations and consumers, or the potential of the eSports industry in the future. The publications included in this cluster are located in the center of the network and have the highest size, which means that they can be considered the most relevant. The publications belonging to this cluster also have the highest link strengths and are related to other publications belonging to the other two clusters. Therefore, this cluster, which forms the basis of the eSport research field, can be labeled 'Sports fundamentals'. It includes papers already mentioned by Wagner (2006), who proposed one of the first scientific definitions of eSports; Jenny, Douglas, Keiper and Olrich (2017), who studied the consideration of eSports as real sports; Witkowski (2012), who analyzed the physical exigency of eSports on players; and Hamari and Sjoblom (2017), who analyzed the concept of eSports and the reasons that justify the consumers' behavior.

The blue cluster includes old and recent empirical publications on eSports from very different perspectives. This cluster, labeled 'eSports analyses', includes papers such as that by Seo (2016), who analyzed eSports consumption and the transformation of video games from a hobby to a professional job; Podsakoff, Mackenzie, Lee and Podsakoff, (2003), who analyzed consumer behavior from a theoretical point of view; and Yee (2006), who analyzed the motivations to play online games.

The green cluster includes the more recent publications focused on hot topics as the reasons that lead to the consumption of eSports, the growing popularity of eSports, and the reasons that encourage the growth of this entertainment industry. This cluster, labeled 'eSports behaviors', includes papers previously mentioned by Funk, Pizzo and Baker (2018), who analyzed the growth of the eSports industry and its potential opportunities within the entertainment industry; Pizzo, Baker, Na, Lee, Kim and Funk (2018), who tried to find similarities between eSports and traditional sports related to the audience and consumption behaviors; and Parshakov and Zavertiaeva (2018), who analyzed the professionalization of eSports, the prizes of tournaments, and the generation of talented players around the world.

Fig. 4 shows the density map of the top one hundred author cocitation analyses**.** The most cited authors are shown with the most intense yellow color, and the least cited authors are colored in green. The position in the map represents the proximity among them; thus, the closer they are, the greater the possibility that they appear together. On the map, it is possible to identify one clear group led by

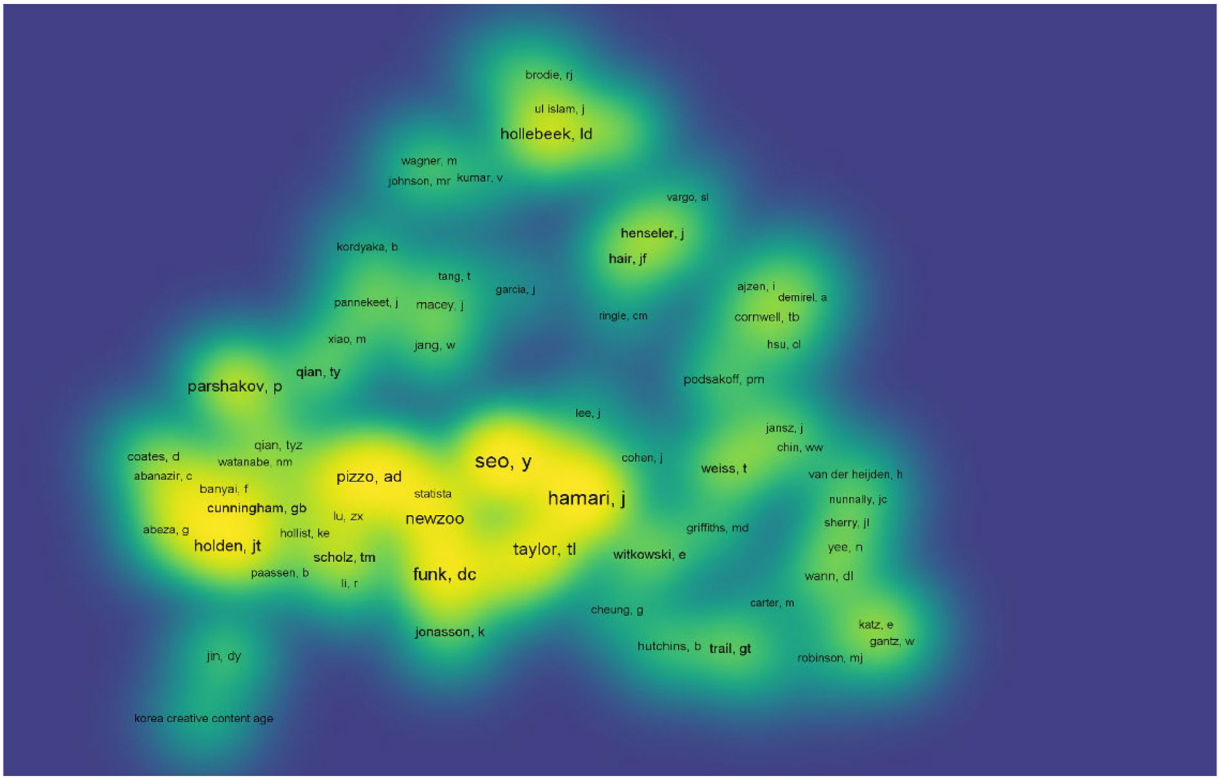

Fig. 4. Density map of co-citation analysis of authors.

Hamari and Seo, who are the authors with the highest number of citations. Other authors, such as Cunningham, Pizzo or Funk, are placed close to them, with publications included among the most cited. The publications related to this group are focused mainly on the definition of eSports and the analysis of the potential of the eSports industry. This group also includes web repositories such as 'Newzoo' or 'Statista' because they are referenced in a significant number of publications. Statista is a portal web leader in collecting statistical information from many fields, being one of the top providers of market and consumer information, and Newzoo is a leading global platform in providing and analyzing data related to the eSports and video game industries.

The rest of the density map is quite fragmented, with smaller groups of authors showing weaker relationships between them. For example, there is a small group of authors, such as Xiao or Tang, who analyze the most relevant factors that explain the reasons that lead the audience to watch eSports.

Bibliographic coupling of sources

Table 5 shows the ten sources with the greatest number of publications on BM&E-eSports. The journal with the most papers published is 'Sport Management Review', with eight articles. This journal has the highest citation rate and link strength, which means that it is the most important scientific journal addressing topics related to business, management and economics within the eSports research field. The second position with six publications is the 'Journal of Business Research', and the third position is the 'Journal of Sport Management' with four publications. Although this last journal has one of the lowest citation rates, probably owing to the recentness of its publications, it has the third highest link strength, probably because its publications are very closely related to the eSports research field. Considering the number of citations, the second position in the ranking is 'Internet Research', with two publications. This position can be justified because the most cited paper by Hamari and Sjoblom was published in this journal in 2017.

Nine of the ten sources analyzed specialize in BM&E. The number of publications on BM&E-eSports is currently quite low, probably because more than half of the eSports publications in WoS have appeared during the last three years, which indicates that the number of publications is expected to grow significantly in the immediate short and medium terms, modifying the figures related to the documents published, citations or link strengths.

Fig. 5 shows four clusters when the bibliographic coupling of sources is considered. The 'Journal of Sports Economics' represents the yellow cluster, with publications related mainly to the motivations and recognition of eSports teams and players, the professionalization of the eSports industry and its influence on players' careers, the possibility of being exclusively professional gamers, or the need for teamwork to achieve the planned objectives. Examples of the publications included in this cluster are those by Ward and Harmon (2019), who studied the careers of eSports professional players, and Mao (2022), who analyzed the importance of tournament prizes to achieve effective collaboration in eSports teams.

Table 5
Bibliographic coupling of sources.

Source	Documents	Citation	Link Strength
Sport Management Review	8	367	355
Journal of Business Research	6	105	187
Journal of Sport Management	4	7	188
Managing Sport and Leisure	4	20	54
Sport Marketing Quarterly	2	70	169
Internet Research	2	311	130
Scientific Annals of Economics and Business	2	4	107
Journal of Sports Economics	2	17	36
Journal of Cultural Economic	2	12	35
Journal of Global Sport Management	2	0	29

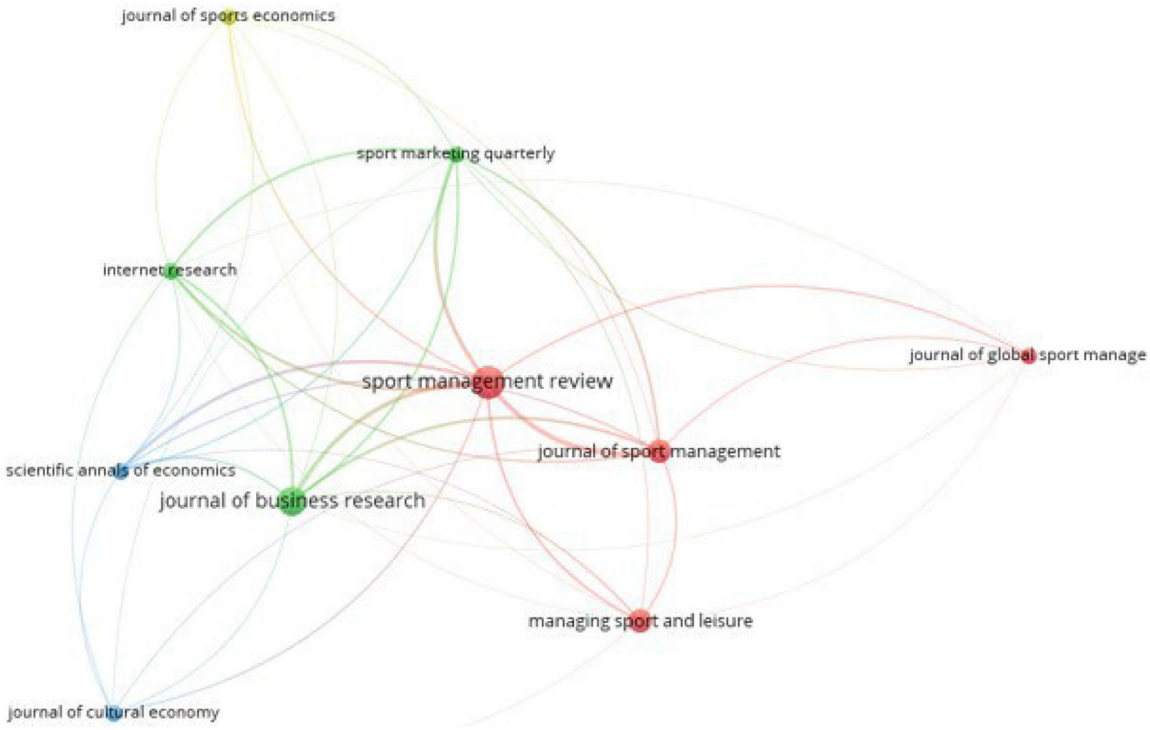

Fig. 5. Bibliographic coupling of sources.

The blue cluster is represented by the 'Journal of Cultural Economic and Scientific Annals of Economics and Business'. It includes publications related to brand management within the eSports industry and how it can affect the brand image of the organizations that want to be associated with this industry, the strategies that can improve the image that consumers have of eSports companies, or the management of sustainable sponsorships. Examples of the publications belonging to this cluster are those by Zhao and Linz (2020), who analyzed the strategies designed by the Chinese company Tencent to improve its image, and Freitas, Contreras-Espinosa and Correia (2020), who addressed the implications of sponsoring an eSports team and its influence on the image of the company.

Three journals represent the green cluster, 'Journal of Business Research', 'Internet Research', and 'Sport Marketing Quarterly', including papers related mainly to the behavior of the people involved in the eSports industry, the consumption patterns of eSports, or the engagement of the eSports audience. This cluster is closely related to the blue cluster, sharing interesting topics such as brand image, sponsorship strategies, and audience rates. Some papers, such as that by Hamari and Sjoblom (2017), who analyzed the reasons that lead people to watch eSports and the implications of the commitment to this industry, are among the ten most relevant to BM&E-eSports and belong to this cluster. Pizzo, Baker, Na, Lee, Kim and Funk (2018) analyzed the motivations of eSports audiences to consume eSports and the reasons that can justify the success of this industry.

Finally, the red cluster with four journals, 'Sport Management Review', 'Journal of Sport Management', 'Managing Sport and Leisure', and 'Journal of Global Sport Management', has the most publications related to the eSports industry, specifically publications related to business, management, and economic issues. Other research topics related to this cluster include the similarities and differences between eSports and traditional sports, the evolution of the eSports industry, and social responsibility issues applicable to the eSports industry. Examples of the publications belonging to this cluster are those by Ke and Wagner (2020), who analyzed how sports clubs use eSports to create contain that allows them to stay close to fans; and Cunningham, Fairley, Ferkins, Kerwin, Lock, Shaw and Wicker (2018), who studied the consideration of eSports as real sports, as well as the role of eSports from a management perspective.

Author keywords co-occurrence

Table 6 shows the most common keywords included in publications related to BM&E-eSports. 'Esports' is the most commonly used keyword, with 35 occurrences. The lack of consensus about how to name eSports justifies the presence of keywords such as those shown in the second ('e-sports') and fourth ('Esport') positions. The keyword placed in the third position is 'video games', and 'gaming' is the keyword placed in the seventh position, which corroborates the strong connection between the eSports and video game worlds. Other keywords such as 'marketing', 'sponsorship' or 'electronic sports' explain the connection of the BM&E-eSports publications with commercial and technology issues, respectively. There is not a great variety of keywords when discussing BM&E-eSports publications, possibly because it is a relatively new research topic with few publications to date. This fact, in turn, highlights its potential growth and future research opportunities.

Table 6
Author keywords co-occurrence.

Keyword	Occurrences	Total link strength
Esports	35	19
e-sports	8	4
Video games	7	6
Esport	5	2
Marketing	4	6
Sponsorship	4	6
Gaming	3	3
Sports	3	3
Uses and gratifications	3	3
Electronic sports	3	2

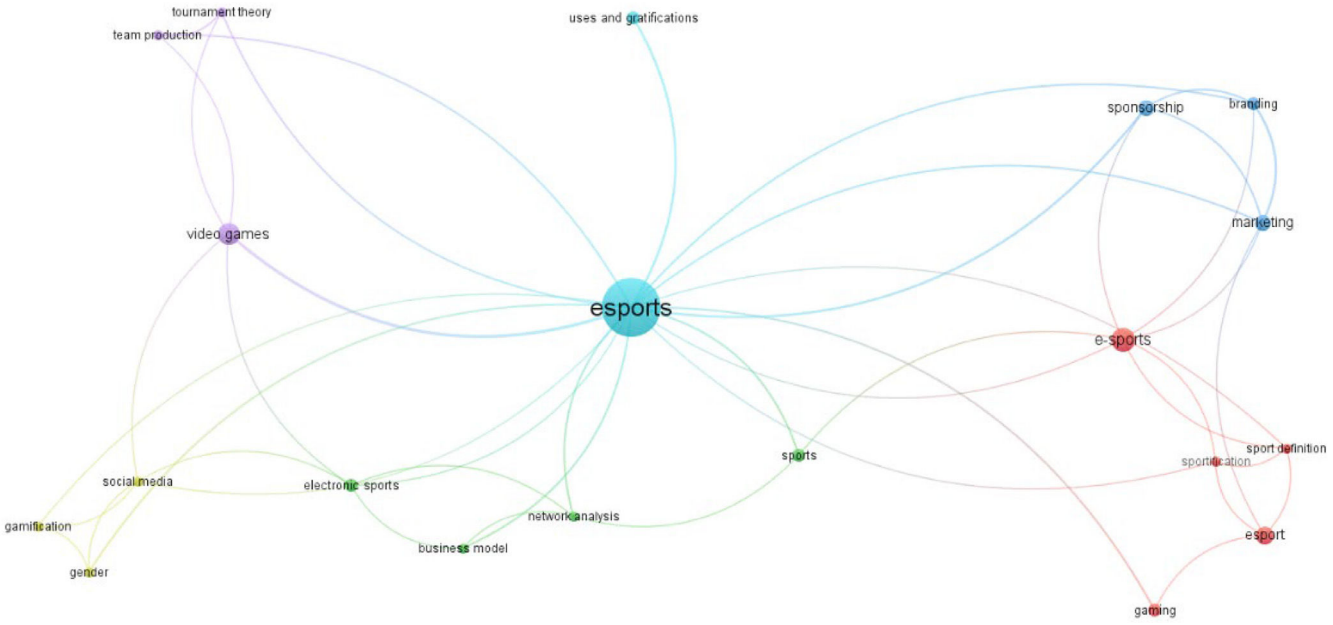

Fig. 6. Author keywords co-occurrence.

Fig. 6 shows the author keyword co-occurrence analysis. The largest circle placed at the center of the map is for 'esports', which means that it is the most commonly used keyword. In addition, six different clusters can be distinguished. The light blue cluster refers to publications analyzing consumption rates; the dark blue cluster relates to publications that analyze the relationship between eSports and marketing issues; the red cluster is focused on the sportification of eSports and the consideration of online games as a sport; the green cluster is mostly dedicated to the analysis of the business models used by eSports companies and the effective networks built between them; the yellow cluster is related to social issues such as gender diversification or the use of social networks within the eSports industry; and finally, the purple cluster is related to the analysis of eSports and video games from a competitive perspective.

The results obtained from the different analyses confirm that, to date, there is no clear and robust theoretical foundation supporting scientific research on eSports, especially if the BM&E-eSports perspectives are considered. The novelty of the topic and, therefore, the limited existing related literature justify this conclusion. These results undoubtedly open many research possibilities in the field of eSports, specifically in BM&E-eSports.

Conclusions, limitations and future lines of research

This bibliometric study is the first to consider the eSports research field from management, business and economic perspectives. The analysis assesses the foundations of BM&E-eSports, and the results allow us to conclude that this research area is currently based on publications related mainly to explaining what eSports are, the differences between eSports and traditional sports, and the commercial potential of eSports within the entertainment industry. This is corroborated because the most relevant authors in the field are Hamari and Sjoblom, who provide a scientific definition of eSports; Hallman and Giel, who discuss the similarities and differences between eSports and traditional sports; and Funk, Pizzo and Baker, who delve into the management and business opportunities of the eSports industry. On the basis of our analysis, we offer our own definition of Esports: "a form of competitive electronic games with significant popularity and worldwide recognition, which take place in virtual environments and combine elements of strategic gameplay, skillful executions, technological advances and structured competition".

Moreover, the co-citation analysis of authors reveals that there is no strong relationship between the most relevant authors because they rely on very different perspectives. The results obtained from the bibliographic coupling of sources show that the number of journals is quite fragmented, with many different journals including few publications. Despite this, 'Sport Management Review' is the most relevant journal in terms of publications and citations when considering the BM&E-eSports research field. Most of the articles of the more important sources have been published since 2020; therefore, an increasing number of publications in less fragmented sources are expected in the coming years. The current structure of knowledge on electrotechnical sports is still in its infancy and needs to be consolidated to provide a more theoretically sound vision that is more anchored in managerial issues. Finally, the author keyword co-occurrence analysis reveals a lack of consensus on how to name eSports with different terms alluding to the same concept. In addition, new keywords related to gaming or marketing are emerging, revealing the trend that new publications follow in the eSports research field.

Bibliometric analyses are subject to several limitations, generally derived from the data chosen and the analytical method used. An adequate criterion to search for information is fundamental to obtain the largest number of publications related to the subject under study. To this end, the indications explained in the Methods section have been strictly followed. No problems arose with the identical names of the authors considered, nor have they arisen from considering only the first author of each study (Córdoba-Cely et al., 2012). The main limitation of the paper refers to the selection of the source to collect the data to be used in the analysis, since the eSports industry has few years of history and consequently a low number of related scientific publications. Given that there is no single source that brings together all the publications and that not all the publications should be selected for their lack of scientific rigor, the WoS database, the most reliable scientific database worldwide, was the source of information in this study.

This study has important practical implications for researchers. The results show an increasing number of publications on BM&E-eSports during the last few years, indicating that this research area will continue to have high potential for future research. The results of the study highlight the most relevant topics in the BM&E-eSports research field, others that require further research and others that, owing to their novelty, have not yet been studied. The study also

identifies the main repositories where the most relevant publications are being published. In this sense, this research offers highly useful information to advance the knowledge in eSports and specifically in the BM&E-eSports research field.

In summary, the BM&E-eSports research field has many expansion possibilities given its relation to other research areas, such as marketing, gaming, sponsorship or technology. In this sense, analyzing how to build a business strategy for eSports companies or how to successfully include new options related to technology or security in the eSports industry can provide fruitful new lines of research. In addition, eSports is not a homogeneous domain; it covers different subcategories, and further research should also seek to obtain a clear analytical typology of its subcategories. It is certain that there will be many changes in the eSports industry in the future, and it is also certain that most of them are still unimaginable.

Author contributions

All authors contributed to the study conception and design. Material preparation, data collection and analysis were performed by all authors. The first draft and previous versions of the manuscript was written and commented by all authors. All authors read and approved the final manuscript.

Statements and declarations

- The authors have no financial or proprietary interests in any material discusses in this article.

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Declaration of competing interest

No potential conflict of interest was reported by the authors.

CRediT authorship contribution statement

M. Ángeles López-Cabarcos: Writing – review & editing, Supervision, Methodology, Investigation, Formal analysis, Conceptualization. **Jérôme Caby:** Writing – review & editing, Methodology, Investigation, Formal analysis, Conceptualization. **Juan Piñeiro-Chousa:** Writing – review & editing, Methodology, Investigation, Formal analysis, Conceptualization.

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