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An overview of sport entrepreneurship field: a bibliometric analysis of the articles published in the Web of Science

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In the sport entrepreneurship field, bibliometric analysis and maps have not yet been used to analyse the production and to visualize the evolution and trends of this field. However, sport entrepreneurship is an emerging field of research where it is necessary to find methodological strategies for understanding the major research trends developing in this specific field. Therefore, the primary aim of this paper is to perform a bibliometric analysis of sport entrepreneurship in the Web of Science Core Collection™. In total, 123 articles were published between 1968-2018 and written by 252 different authors from 189 institutions and 36 different countries. The evolution of these papers published by year, institution, country and journal was analysed. Moreover, a co-occurrence analysis between authors, citations and keywords was performed, as was a thematic analysis. Finally, suggestions for future research to consolidate and develop this field with implications for researchers and policy makers are discussed.

Keywords: sport, entrepreneurship, innovation, bibliometric analysis, Web of Science

Introduction

Given the size of the sports industry relative to the global economy, it requires continued attention from both entrepreneurship and sports management researchers, and

it is critical that sports entrepreneurship researchers continue their work (Ratten, 2012). However, Olivier (2006) suggests that although sport has been studied from a variety of different disciplines, little is known about it from an entrepreneurship perspective.

Sport entrepreneurship is a rapidly emerging research field in which sport management is combined with innovation and entrepreneurship research (Ratten, 2018). It is defined as “*a sports-related organization acting innovatively in a business context*” (Ratten, 2010, p. 559). Entrepreneurship is very important for the sports sector, due to the rapidly changing consumer demands and expectations, so constant innovation is vital to meet and exceed demands and expectations (Ball, 2005). Jones et al. (2017) suggest that the opportunity to innovate is often the reason people engage in sports entrepreneurship. Moreover, Ratten and Ferreira (2017) suggest that understanding entrepreneurship in sport can help us understand how sport entrepreneurship can be developed. Therefore, to understand the nature of this field, this study provides an overview of the sport entrepreneurship field by analysing the articles published within the research journals contained in the Web of Science (WoS), which is one of the main international databases.

Bibliometric analysis is a recognized and established process used to evaluate qualitative and quantitative changes in scientific publications through the application of mathematical techniques (Blasco-Carreras, Morant and Ribeiro-Navarrete, 2015). With this type of analysis, it is possible to: identify the main changes or characteristics of a specific topic; to explore, organize and analyse historical data; to identify useful patterns for the advancement of research and development; and to identify the main changes or characteristics of a specific scientific development topic (Cadavid-Higueta, Awad and Franco-Cardona, 2012).

According to Durieux and Gevenois (2010), there are mainly three types of

bibliometric indicators: (1) quantity indicators, which measure productivity in relation to the number of publications; (2) quality indicators, which measure the impact of a publication in relation to the number of citations; and (3) structural indicators, which measure the connections between publications. In this study, these three indicators will be considered to analyse the articles published in this domain.

In the entrepreneurship field, bibliometric indicators are also important tools to identify the number and distribution of publications, authorship, co-authorship and most cited articles and authors. However, although bibliometric analysis regarding entrepreneurship in general (Ferreira, Reis and Miranda, 2015; Meyer et al. 2014) and different types of entrepreneurship have been previously performed, namely, entrepreneurial intentions (Liñán and Fayolle, 2015; Valencia, Montoya and Montoya, 2016), entrepreneurship education (Loi, Castriotta and Di Guardo, 2016), social enterprise and social entrepreneurship (Granados et al., 2011), entrepreneurship and family firm research (López-Fernández, Serrano-Bedia and Pérez-Pérez, 2016), female entrepreneurship (Ferreira et al., 2017) and social entrepreneurship (Rey-Martí, Ribeiro-Soriano and Palacios-Marqués, 2016), there are no recent bibliometric analyses about sport entrepreneurship. There is only one published article regarding sport entrepreneurship (González-Serrano, Valantine and Crespo, 2014), and it requires updating because it contains no structural indicators.

Thus, this study will allow researchers to effectively understand the sport entrepreneurship field and to identify relevant topics, the most popular authors, institutions, articles, keywords and the relationships between them. It will also allow researchers to identify current trends and future research areas in this field. This study seeks to contribute to the gap existing in the entrepreneurship literature by analysing the

field of sport entrepreneurship using bibliometric techniques based on descriptive, co-occurrence analysis and thematic analysis.

Materials and methods

Data collection

The data were gathered from the Web of Science Core Collection™ using these indexes: Science Citation Index Expanded (1900 to present), Social Sciences Citation Index (1956 to present), Arts & Humanities Citation Index (1975 to present), Conference Proceedings Citation Index- Science (1990 to present), Conference Proceedings Citation Index- Social Science & Humanities (1990 to present), Book Citation Index- Science (2005 to present), Book Citation Index- Social Sciences & Humanities (2005 to present) and Emerging Sources Citation Index (2015 to present). The Web of Science database was chosen because the impact factor remains the most widely used of the indexes available (Falagas et al., 2008). All these indexes were compiled from the online database run by Thomson Reuters, which contains academic publications and bibliographical information regarding the authors. An advanced search was performed, not applying any chronological or language filter, and used these research terms: (sport* AND (entrepreneur* OR innovat*)). Using the advanced search, we selected the title field (TI), and only articles were selected as document type. This search was conducted on 2018-12-03, and there was no language restriction as English is the default language for the title, abstract and keywords. This advanced research process returned 123 articles with dates of publication between 1968 (three articles) and December 2018 (13 articles).

Data analysis

A bibliometric analysis of quantity and quality was performed in which the productivity of a specific type of entrepreneurship, namely, sports entrepreneurship, is

analysed. For this purpose, indicators such as the analysis of authors, countries and most productive journals were included to highlight the research trends. In addition, co-occurrence analysis was performed to analyse the relationship between authors, keywords and citations. After performing the advanced search, the records were saved in a plain text format with the following fields: Authors, Keywords, Abstract, Year Published, Subject Category, Publication Name, ISSN and Times Cited.

After that, it was necessary to clean the gathered data. It was checked for duplicated records and for unknown data and the author names were standardized. Then, using the different techniques that are available to construct bibliometric maps (Van Eck, Waltman, Dekker and Van den Berg, 2010), the results were analysed using descriptive methods, bibliometric analysis, and bibliometric mapping. For that purpose, the statistical programme HistCite (version 2010.12.6; HistCite Software LLC, New York, USA), Pajeck (version 3.14, 2013.11.12; Batagelj and Mvar, University of Ljubljana, Ljubljana, Slovenia), BibExcel (version 2011.02.03; Olle Persson, Umeå University, Umeå, SWE) and VOSviewer (Van Eck and Waltam, 2009), Leiden University, the Netherlands) were used.

The HistCite software was used to analyse the number of articles published by year and by author; the number of citations of each author, each article and each journal; and the number of articles published in each language and in each country. The BibExcel software was used to analyse the keyword networks and the author networks. Finally, the VOSviewer software was used to analyse the co-citations, abstracts and title terms, and density citation maps.

The analysis was conducted in two phases. First, it calculated the basic bibliometric indexes (number of articles published by year, by language, by country, by

institution, by journal and by author), and second, co-keyword, co-authoring, co-citation and title and abstract terms were analysed.

Both indexes of quantity and quality have been considered to analyse the research productivity of the different fields. To analyse the quantity, the number of articles by year, authors and journal have been considered. By contrast, Shen et al. (2018) highlight that citation frequency is considered an index of quality of research productivity, so it is important to consider both of them. Thus, the total global citation score (TGCS) and the total local citation score (TLCS) were also considered in this study as qualitative indicators.

TLCS is related to the number of times that a group of papers included in a collection has been cited by other papers within the same collection, whereas TGCS is related to the number of times that a group of papers included in a collection has been cited in the WoS of Science™ Core Collection (Garfield, Pudovkin and Istomin, 2003). These indicators were calculated using the programme HistCite (version 2010.12.6; HistCite Software LLC, New York, USA).

Results

Basic bibliometric indicators

The WoS (Web of Knowledge) database search showed 123 articles published in 83 different journals, with 252 different authors, from 189 institutions and 36 different countries. The number of articles published per journal varied between five and one in the selected journals. In this section, the chronological evolutions of the papers published by years, the languages of the articles published, the institutions and the countries of the authors, the journals and author with a larger number of papers and citations, and the paper with the largest number of citations are analysed.

Chronological evolution of the articles published

Considering the publication year of the 123 articles, a trend can be observed from the year in which the first article was published in 1986 (1) to the present (13). The turning point was in 2015, when 21 articles were published, and this spike was due to a special issue about innovation in alpine sports and leisure activities published in the “Society and Leisure” Journal. In 2016, the same number of articles was published, increasing to 28 articles in 2017 (see Figure 1). This increase was explained by the publication of a special issue about entrepreneurial sport policy in the “International Journal of Sport Policy and Politic”. Finally, 13 articles were published in December 2018,. Therefore, publications in the sport entrepreneurship field have progressively increased during this period.

Analysing the number of citations these articles have received, by year, in the whole WoS database, the articles from 2016 and 2014 were the ones that received the largest number of citations. In Figure 1, the evolution trend for the articles published by year can be observed.

Languages of the articles published

Considering the language in which the articles were published, the majority were in English (101), followed by Spanish (12), with a limited number in French (4) and Portuguese (3), and one article in each Croatian, German and Russian. Thus, English is the predominant academic language of publication for sports entrepreneurship (see Figure 2).

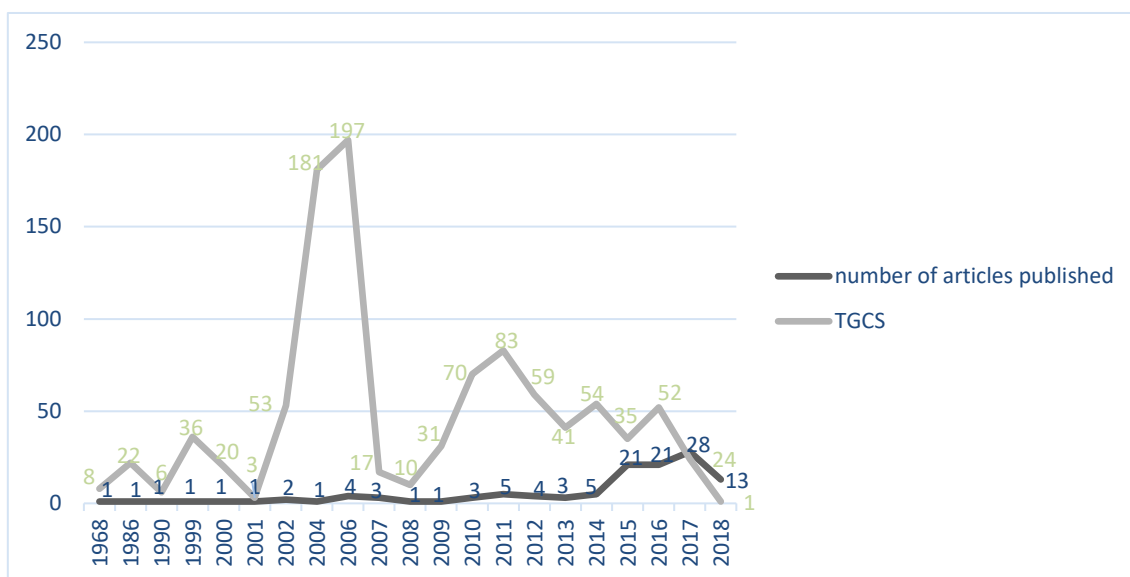


Figure 1. Chronological evolution of articles published and TGCS until December 2018.

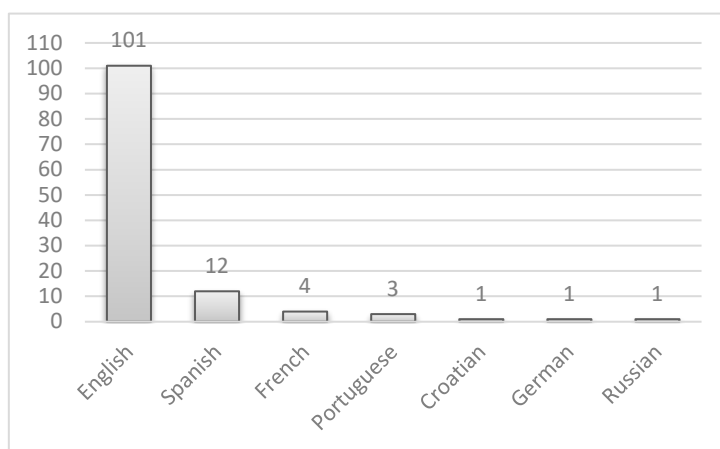


Figure 2. Languages of the articles published until December 2018.

Institutions and countries of the authors

The institutions with the highest number of articles published are (1) La Trobe University, with six articles published; (2) the University of Valencia, with five articles published; and (3) three articles published each at Duquesne University, Islamic Azad University and University of Sevilla. However, the institution with the largest number of citations is Azad Islamic University (TLCS = 25; TGCS = 70).

The main countries demonstrating research outputs in the field of sport entrepreneurship are the United States (USA) (21 articles), Australia (15 articles), Spain and the United Kingdom (UK) (12 articles), and France (11 articles). The country with the highest rate of citations was the USA (TLCS = 7; TGCS = 54), followed by the UK (TLCS = 37; TGCS = 233) and Australia (TLCS = 9; TGCS = 29) (see Table 1).

Table 1. Country of the authors, number of articles, GCS and LCS (1968-December 2018)

Country	No. of articles	TLCS	TGCS
USA	22	37	233
Australia	15	5	29
Spain	12	0	16
UK	12	7	54
France	11	10	28

Journals that published more articles in this field

Analysing the journals that have published more articles about entrepreneurship and sport, as a criterion, the journal that has published two or more articles was selected. The journals that have published more articles during the years have been the "*Innovation Management Policy & Practice*" (Taylor and Francis), the "*International Journal of Sport Policy and Politics*" (Taylor and Francis) and the "*Journal of Sport Management*". It is worth stating that two of these journals have "sport" as part of their title and central focus.

By contrast, the journals that have received the most citations of articles on this subject were analysed for impact using a search carried out in the WoS (TGCS) and have been the "*Journal of Sport Management*", followed by the "*International Entrepreneurship and Management Journal*" (Springer) and the "*Journal of Management and Organization*". Taking into account the most cited journals in the WoS in general (TGCS), it is also worth highlighting that in first position is the "Sport Management" (TGCS = 71), followed by "R & D Management" (TGCS =45) and the "International

Entrepreneurship and Management Journal" (TGCS = 41). In Table 2, the journal with the largest number of published articles is presented.

Author with more articles published in this field

Focusing on the authors with the largest number of publications, the selection criterion used was to have published two or more articles. The author with the largest number of published articles is Ratten, V. with nine articles, followed by Calabuig, F. and Crespo, J. with five articles each, and Gonzalez-Serrano, M.H. with four articles (see Table 3).

Considering the most cited authors in the WoS (TGCS), Ratten, V. was the most cited author, followed by De Groot, S., Janssen, T.W.J. and van der Woude, L.H. These three authors were the ones with the highest rate of citations according to the number of published articles (TGCS/number of articles) taking into account the minimum requirement of having at least two published articles. In Table 3, the results are presented as follows.

Table 4 includes the 11 articles that have received the largest number of citations. The number of citations received varies from 14 to 0, taking into account the TGCS. The most cited article is from Ratten (2011), in which a theory of entrepreneurship in sports management is explained based on the relationship between entrepreneurship and sport. The second group is Caza (2000), Hoerber and Hoerber (2012) and Shane and Venkatarama (2012), with eight citations each. Table 5 shows that the content of these articles is classified into clusters, and the content is explained.

Table 2. Journals, number of articles, TGCS and TLCS (1968-December 2018)

	Journals	Articles	%	TGCS	TLCS
1	Innovation-Management Policy & Practice	5	4.10%	8	4
2	International Journal of Sport Policy and Politics	5	4.10%	7	0

3	Journal of Sport Management	5	4.10%	71	17
4	Agro Food Industry Hi-Tech	4	3.30%	0	0
5	European Sport Management Quartely	4	3.30%	19	6
6	Loisir & Societe-Society and Leisure	4	3.30%	4	1
7	Sport Management Review	4	3.30%	38	9
8	Annals of Applied Sport Science	2	1.60%	0	0
9	Education and Training	2	1.60%	0	0
10	Environment and Planning A	2	1.60%	36	2
11	International Entrepreneurship and Management Journal	2	1.60%	41	14
12	International Journal of Pharmatheutical Research and Allied Sciences	2	1.60%	0	0
13	Journal of Management & Organization	2	1.60%	29	11
14	Materiales para la Historia del Deporte	2	1.60%	0	0
15	Media International Australia	2	1.60%	2	0
16	R & D Management	2	1.60%	45	6
17	Sport Business and Management-An International Journal	2	1.60%	6	0
18	Sport Management Education Journal	2	1.60%	2	1
19	Sportis-Scientific Technical Journal of School Sport Physical Education and Psychomotricity	2	1.60%	0	0

Co-keywords, co-citation and thematic analysis

Keywords

Regarding keywords, a criterion was that these words must be present in at least two or more articles. Based on this criterion, three main networks of keywords were obtained. One of these networks was formed by the keywords innovation management, sport management, sport, entrepreneurship and innovation, of which innovation is a key element. The most repeated relationships in this network are sport entrepreneurship and sport innovation.

Table 3. Authors with most published articles in the field of sport entrepreneurship

Author	No. of publications	TLCS	TGCS	TLCS/ Nb Articles	TGCS/Nb. Articles
Ratten, V.	9	28	80	3.11	8.89
Calabuig, F.	5	0	9	0.00	1.80
Crespo, J.	5	0	9	0.00	1.80

Gonzalez-Serrano, M.H.	4	0	5	0.00	1.25
de Groot, S.	2	0	66	0.00	33.00
Desbordes, M.	2	6	14	3.00	7.00
Emrich, E.	2	1	8	0.50	4.00
Herranz-de-la-Casa, J.M.	2	0	7	0.00	3.50
Hoeber, L.	2	12	34	6.00	17.00
Hoeber, O.	2	12	34	6.00	17.00
Hutchins, B.	2	0	2	0.00	1.00
Janssen, T.W.J.	2	0	66	0.00	33.00
Jones, P.	2	1	3	0.50	1.50
Koenigstorfer J	2	3	11	1.50	5.50
Manfredi-Sanchez, J.L.	2	0	7	0.00	3.50
Meese, J.	2	0	2	0.00	1.00
Peachey, J.W.	2	3	12	1.50	6.00
Perez-Campos, C.	2	0	4	0.00	2.00
Podkalicka, A.	2	0	2	0.00	1.00
Potts, J.	2	1	1	0.50	0.50
Razavi, S.M.H.	2	0	0	0.00	0.00
Rojas-Torrijos, J.L.	2	0	7	0.00	3.50
Toohey, K.	2	1	4	0.50	2.00
Valantine, I.	2	0	1	0.00	0.50
van der Woude, L.H.	2	0	66	0.00	33.00
Wemmer, F.	2	3	11	1.50	5.50
Winand, M.	2	2	4	1.00	2.00
Yoshida, M.	2	3	22	1.50	11.00

Table 4. Most cited articles (1968-December 2018)

Rank	Authors	Cites	Journal
1	Ratten (2011a)	14	International Entrepreneurship and Management Journal
2	Caza (2000)	8	Journal of Sport Management
3	Hoeber and Hoeber (2012)	8	Journal of Sport Management
4	Shane and Venkataraman (2000)	8	Academy of Management Review
5	Cohen (1990)	7	Administrative Science Quarterly
6	Ratten (2010)	7	Journal of Management & Organization
7	Winand, Vos, Zintz and Scheerder (2010)	7	International Journal of Sport Management and Marketing
8	Ball (2005)	6	Hospitality, Leisure, Sport and Tourism Network
9	Damanpour and Schneider (2006)	6	British Journal of Management
10	Desbordes (2002)	6	Technology Analysis & Strategic Management,

The second keyword network is sports journalism. Within this network, the keywords “sports journalism”, “entrepreneurial journalism”, “digital storytelling” and “digital journalism” stand out. Finally, the third network of keywords is the one related to social media, highlighting within it the words “sport communication”, “social media” and “Twitter”. In Figure 3, these keyword networks can be seen.

Authors

When we created the networks between the authors in the field of sports entrepreneurship, it was established as a criterion that these authors needed to have two or more articles published together. As shown in Figure 4, there are seven main networks of collaboration.

Table 5. Groups resulting from cluster analysis of the co-citation

Authors	Key findings
Cluster 1: Technology innovation products and services approach	
Chesbrough (2006)	This author presents the term "open innovation" (it is a new model for industrial innovation), that has been incorporated into the innovation practices of a large number of companies and offers a perspective on where open innovation is going in the future.
Cohen and Levinthal (1990)	In this paper, the ability of a firm to recognize the value of new external information, assimilate it, and apply it with commercial finality is discussed as a critical aspect of innovative capabilities. They formulate a model of firm investment in research and development (R&D) and pointed out the importance of the investment in this area. (Quantitative)
Desbordes (2002)	This study analyses the innovation in the French sport equipment industry. The results showed a link between the product's life cycle and the structure of the industry. Slightly declining sectors (skiing or yachting), tend to focus on process innovations, meanwhile fast expanding sectors (snowboard, mountain bike or cycling), innovate much more on new products and materials.

Franke and Shah (2003)	In this article, how sport communities support innovative activities is analysed. The findings suggest that these individuals often archetype novel sports-related products and they receive support in developing their innovations from fellow community members. All of this information is shared within these communities.
Lüthje (2004)	The author found that consumers of outdoor sports have high levels of innovation. Innovating users can be distinguished from non-innovating ones by the benefit they expect from using their innovations and the level of expertise they have in the use of the products. Therefore, innovation by users can be an important source of new product ideas for consumer goods companies.
Lüthje, Herstatt, and von Hippel (2005)	This author, in a study of innovations developed by mountain bikers, found that user innovators usually utilize information generated by themselves to determine the need for and to develop the solutions for their innovations. (Quantitative)
Rogers (1995)	This paper explains the main elements in the diffusion of innovation models, and how to apply them to the special case of the diffusion of new telecommunications technologies. (Theoretical).
Von Hippel (1988)	The author presents a series of studies showing that the sources of innovation differ greatly between fields. In some of them innovation users develop the most innovations, while in others, suppliers of innovation-related components and materials are the typical sources of innovation. Therefore, he explores why the variations of the sources occurs and how this could be predicted.

Cluster 2. Sport entrepreneurship, management and education approach

Ajzen (1991)	This author reviews various aspects of the Theory of Planned Behaviour (TPB). Intentions to perform different kinds of behaviours can be predicted with high levels of attitudes towards behaviour and perceived behavioural control. The relation of the subjective norm and the past behaviour to the prediction equation are issues that remain unresolved. However, in general, this theory is well supported by empirical evidence.
Ball (2005)	This author highlights the importance of the entrepreneurial teaching of hospitality, leisure, sport and tourism (HLST) within higher education. He found that although there is evidence of entrepreneurship opportunities in HLST programmes across the subjects, its inclusion in sports science and coaching degrees is scarce. (Theoretical).
Fornell and Larcker (1981)	In this paper, the statistical tests are used in the structural equation model analysis with unobservable variables and the measurement errors are studied. To resolve these problems, the authors developed and applied a testing system based on measures of shared variance within the structural model, measurement model, and overall model. (Theoretical)
Ratten (2010)	This paper focuses on sport management as a business field that has an audience that leans toward social responsibility, influenced by the fact

that social responsibility and philanthropy in sport has become very important. Finally, it concludes that a sport context has the opportunity to model socially responsible practices through entrepreneurial ways. (Qualitative)

- Ratten (2011a) This author develops a theory of entrepreneurship in sports management by investigating the relationship between entrepreneurship and sport. She explained different types of entrepreneurship that occur in sports management, and implications and future research directions are exposed. (Theoretical)
- Ratten (2012) This author examines the role of the sports entrepreneur and the entrepreneurial process in a new sport venture creation. This paper contributes to our understanding of the phenomenon of entrepreneurship in the sports context, providing a strong theoretical framework for future research. (Theoretical)
- Ratten (2011b) This paper introduces the topic of sports entrepreneurship and discusses the importance of social entrepreneurial orientation in sports. The social institutional perspective of sport entrepreneurship presented in this paper illustrates the role of sport in society, presenting practical implications of sport related to social entrepreneurship and innovation. (Theoretical)
- Shane and Venkataraman (2000) This study points out that the phenomenon of entrepreneurship has lacked a conceptual framework. Therefore, it analyses research conducted in the different social science disciplines and applied fields of business to create a conceptual framework for the entrepreneurship field. (Theoretical)

Cluster 3. Determinants of innovation in sport organizations approach

- Caza (2000) This author analyses a specific case of innovation in the Amateur Boxing Association sport organization within the framework of the metaphor of context receptivity, and concludes that this is a useful framework for understanding changing outcomes in sport organizations. (Qualitative, ethnographic case study)
- Crossan and Apaydin (2010) This paper, based on a systematic review, synthesizes different research perspectives into a comprehensive multi-dimensional framework of organizational innovation and suggests measures of organizational innovation determinants. (Systematic review)
- Damanpour (1991) This study analyses the relationships between organizational innovation and its potential determinants. It was found that relationships between the determinants and innovation are stable and that the type of organization adopting innovations and their scope are the most effective moderators. (Meta-analysis)
- Damanpour and Schneider (2006) This study examines the effects of environmental and organizational factors and top managers' characteristics and decisions in the implementation of innovation in US public organizations. It was found that organizational characteristics and top managers' attitudes towards innovation have the strongest influence in the adoption of innovation. (Quantitative)

Hoeber and Hoeber (2012)	This paper classifies the determinants that contribute to the innovation process, and identifies at which particular stage of innovation these determinants were of special importance in community sport organizations. (Qualitative, case study)
Winand et al. (2013)	This study developed an explorative sort of sports federation based on their perceptions and attitudes of determinants of innovation and their innovation capacity. Three different types were found: traditional sports federations, financially secure sports federations and competitive sports federations.
Wolfe (1994)	This paper presents a conceptual review of the innovation literature by summarizing and organizing prior research into three topics. Finally, the author suggests some strategies for conducting more innovation research. (Review)

The largest of these is (1) Crespo J, Calabuig F, González-Serrano MH, Valentine I and Pérez-Campos C. Within this collaboration network, taking into account the thickness of the line, Calabuig F and Crespo J, and Calabuig F and González-Serrano MH, are the ones that have collaborated the most between them.

Another of the main contact networks is the one formed by (2) Van de Woude LHV, de Groot Sand Janseen TWJ. There are also other collaboration networks, such as: (3) Koenigstorfer J and Wemmer F, Meese J and Podkalicka A; (4) Noeber L and Hoeber O; (5) Jones P and Ratten V and (6) Manfredi-Sánchez JL and Rojas-Torrijos JL. As can be seen in Figure 4, there are not many contact networks with two or more articles published, and the vast majority of these networks are small (two-three authors).



Figure 3. Keywords networks

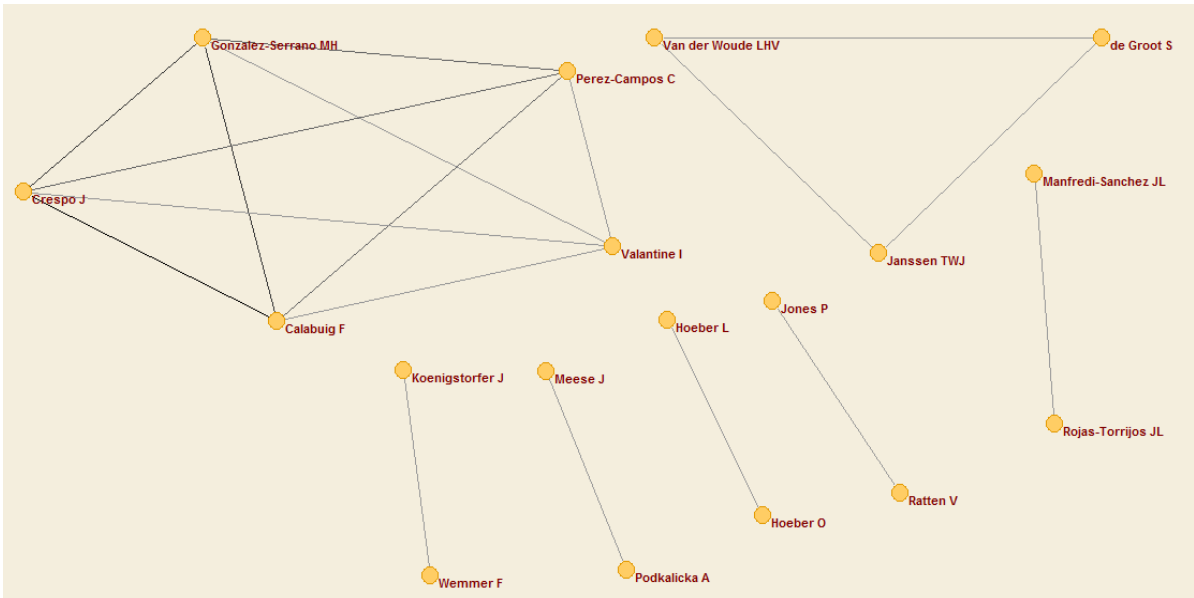


Figure 4. Greater than or equal to two co-authored publications

Co-citation

In this section, we present the co-citation networks. The initial sample of 123 articles was reduced to those containing no less than five citations, resulting in 24 publications. This group contained 24 articles with at least five citations each and was cited by a total of 143 publications. The analysis of co-citation is adequate for establishing co-citation networks and

organizing them into clusters. This analysis reveals three distinct clusters that were named according to their main contribution:

- Cluster 1: Technology innovation products and services approach
- Cluster 2: Sport entrepreneurship, management and education approach
- Cluster 3: Determinants of innovation in sport organizations approach

In Figure 5, the most cited articles are presented according to the cluster, and then the thematic analysis of the articles of the three clusters is explained:

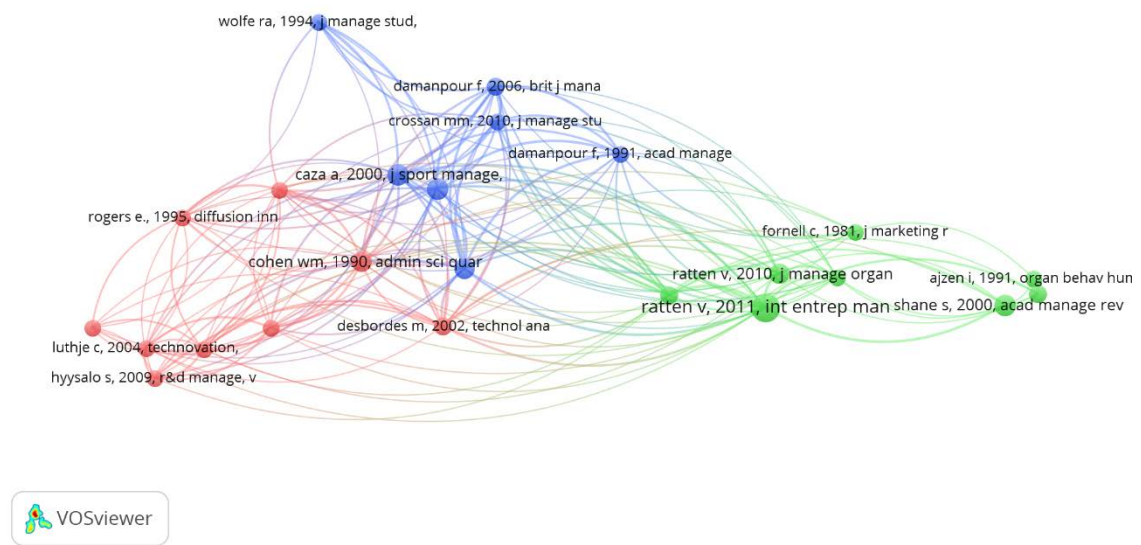


Figure 5. Co-citation network and respective cluster

Thematic analysis

The thematic analysis used 128 different terms appearing in the titles and abstracts, which were grouped by categories. The criterion of inclusion had an occurrence frequency of >5. The exclusion criteria were terms related to the design or methodology of the research performed and the keywords used in the advanced search: innovation, sport and entrepreneur and its derivation. The terms were filtered to group together the synonymous terms as well as those that appeared in singular and plural. As shown in Figure 6, three small groups were identified from 1968 to December 2017. Its associated terms are shown with different colours and lines: sport entrepreneurship education in

university research in blue (sport sector, education, university), technology and entrepreneurship or innovation in business in red (industry, technology, business) and another field related to sport management based on entrepreneurship in green (organization, sport management, social entrepreneurship). In this last group, the term social entrepreneurship is emerging in relation to organization.

In addition to the network maps, a density map was also generated with title and abstract terms in the VOSviewer (see Figure 7) as in previous studies (similar to Giménez-Espert and Prado-Gacó, 2018). The colour of the map points represents the density of the term during the period of the study (red represents higher density and blue circles represent lower density). The density of the map point was calculated utilizing the number of neighbouring terms and the amount of terms (Van Eck and Waltman, 2009). The greatest density in the cluster was the terms “education” terms “education”, “industry” and “organization”. With the lowest density, we can observe the terms “social entrepreneurship”, “sport sector” and “business”.

Discussion

In this study, a bibliometric analysis of sport entrepreneurship in the Web of Science Core Collection™ was conducted. The main aim was to describe the number of published articles,

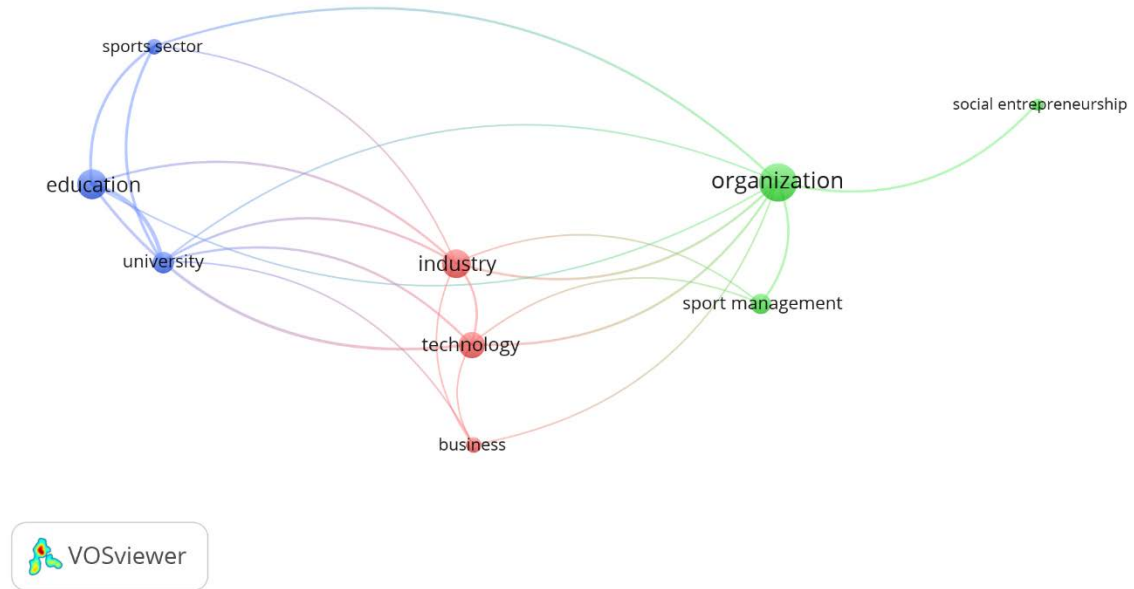


Figure 6. Abstract and title terms from 1968-2018 (December)

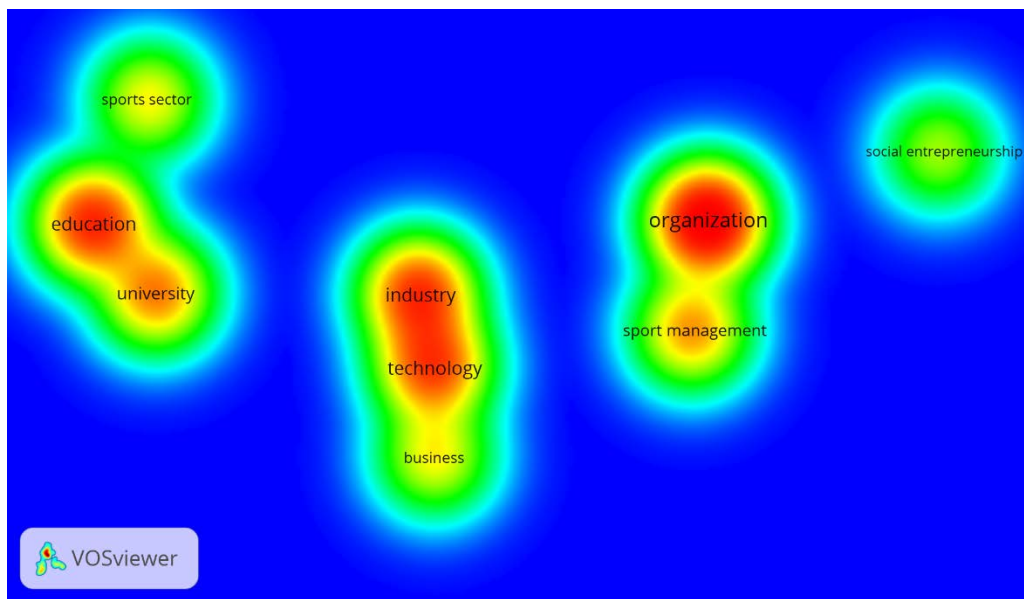


Figure 7. Density citation map of the word published in journal from 1968-2018 (December).

the languages of the articles, the countries and institutions of the authors, the most cited authors and articles, the co-keywords, co-citation, co-authorship and the thematic analysis (title and abstract terms) since December 2018. It is important to note, as previously indicated, that although bibliometric analysis in entrepreneurship in different fields was

carried out, no studies that analysed co-occurrence and thematic analysis were found in sport entrepreneurship.

In this study, we evaluated the quality of the articles published by taking into account TLCS and TGCS indicators. They have been the key indicators capable of evaluating the relevance of each research paper in our sample, as in previous articles (Ferreira et al., 2017; Giménez-Espert, Prado-Gascó, 2018; Thulasi and Arunachalam, 2010). TLCS and TGCS have helped us in our research to identify the most relevant work on the topic. However, it should be noted that TLCS presents only the important papers for a chosen research area, whereas TGCS mainly displays the effects of the papers related to a chosen research area on the papers in the WoS Core CollectionTM. Therefore, these indicators are useful in assisting other researchers in evaluating the relevance of the papers.

According to the results of our study, the number of articles published during the last years (1968-2018) in sport entrepreneurship has increased. Since the first paper that was published in 1968, to the 13 that were published in 2018 (until December), it can be seen that sport entrepreneurship is a new and emerging field of research (Ratten, 2018). Moreover, the majority of the articles were published by authors from the USA, Australia or the UK and Spanish universities. However, it is in the USA where the majority of these articles were published. This could be due to their advanced entrepreneurial policies and well-developed sports sector. For instance, university sports in the USA have significant financial support from universities and society by developing a special model to support the dual career path of university elite sport players.

The researchers analysed in this study have published between one and nine papers, although only four of them produced >2 articles, while 248 researchers published ≤2 articles. The researcher who has published the most is Ratten, V. from Australia,

publishing articles within the sport entrepreneurship field regarding different perspectives, including conceptualizing sport entrepreneurship, sport management through an entrepreneurial perspective, sport innovation management, social entrepreneurship, lifestyle sport entrepreneurship and sport education through an entrepreneurial perspective. Ratten (2011) developed a sport-based entrepreneurship theoretical framework that is the most cited article in this field.

The journals that have published the largest number of articles in this field were the “Innovation: Management Policy & Practice”, the “International Journal of Sport Policy and Politics” and the “Journal of Sport Management”, with the largest number of citations. However, the number of articles published was small, varying from five to one. According to the number of citations in the WoS (TGCS), the number of citations varies between 71 and zero, while taking into account the number of citations in the search done within the WoS varies from 17 to zero. The number of citations is not large because it is a young field of research. The journals with the largest number of citations, taking into account TGCS, were "Sport Management", followed by "R & D Management" and "International Entrepreneurship and Management Journal". Therefore, the two journals with the largest number of citations were not specific to entrepreneurship but more about management, and by contrast, the third journal was about entrepreneurship and management.

There were seven main networks of collaborations between authors, but they are characterized as small networks. The size of the networks varies between five and two authors. The largest one is the one formed by Calabuig, Crespo, Pérez-Campos, Valantine and González-Serrano. There is another network formed by three authors (Van de Woude, de Groot Sand Janseen), but the other five networks are formed by only two researchers each. Thus, collaboration networks are still nascent in number and size.

According to the keywords, three main consistent networks of keywords were identified: (1) sport innovation and entrepreneurship, (2) sport journalism and (3) social media in sport. These network keywords were analysed using the criterion of having occurred in two or more papers. Therefore, it seems that there are three general sub-fields of keyword interest: one related to sport management, innovation, innovation management and entrepreneurship in general and another related to the keywords sport journalism, entrepreneurial journalism, digital storytelling and digital journalism, and sport communication, social media and Twitter. The most important and strong relationships were between sport and innovation and sport and entrepreneurship.

Similarly, there are three main areas of research or approaches: (1) the technology innovation products and services approach; (2) the sport entrepreneurship, management and education approach; and (3) the determinants of innovation in sport organizations approach. The first area of research is based on how using new technology innovation can be developed by developing or improving new products or services. The second area refers to the conceptualization of sport-based entrepreneurship, sport management through an entrepreneurial perspective and sport entrepreneurial education. The third area is related to the factors that influence the development of the innovative culture of the sport industries and the different types of innovation that could be developed.

Finally, according to the thematic analysis, the greatest density was found in the terms “education and university”, “industry and technology” and “organization and sport management”. With lower density, the term “social entrepreneurship” appeared. Therefore, these themes are in line with the previously presented material, in which technology seems to be quite important in this field, as well as sport management and education, and seems to be a more consolidated group of research in this field. However,

social entrepreneurship seems to be a new line of research that is emerging within sport entrepreneurship.

This paper is not without limitations. The first one is that only articles published in the WoS Core Collection™ have been analysed, which does not take into account other databases. Therefore, future studies should focus not only on this database but should also take into account other databases (e.g., Scopus and EBSCO). Moreover, it would also be interesting for future research to focus on the articles published in some specific journals that specialized in entrepreneurship, to know what the stage of sport entrepreneurship is in these journals and to compare the thematic analysis of them, as well as quantitative and qualitative indicators, to understand the stage of the sport entrepreneurship field within them.

Conclusions

This study allows a more effective understanding of the current state of sport entrepreneurship and sport innovation research and its evolution since its inception. This information is important for the future development of entrepreneurship sport research, both for academicians and professionals, by presenting current trends and future directions of research.

According to the thematic analysis, there are three different topics: one related to product innovation in sports, another regarding sport entrepreneurship management and education and a third about determinants of innovation in sport organizations. Here, education, technology and sport management are very important topics for the field of sport entrepreneurship or sport innovation. Social entrepreneurship is another topic that is not as popular as the ones previously presented, but it is gaining increased importance.

Furthermore, it is necessary to develop more empirical research, both qualitative and quantitative, although there are some case studies and empirical quantitative

studies, the vast majority of them are theoretical. Moreover, there is a lack of published articles that are experimental or longitudinal in design. Therefore, future research could be undertaken

Table 6. Gaps in the sport entrepreneurship field and recommendation and for the development and consolidation of it.

“GAPS”	RECOMMENDATION FOR SPORT ENTREPRENEURSHIP FIELD DEVELOPMENT
The majority of the papers are theoretical	More empirical (qualitative and quantitative or mixed) and experimental research is needed. The samples of the studies should be from different categories: students, workers, and managers. These people should also have different backgrounds to share between samples of similar characteristics.
The collaboration networks between authors are scarce and small	It is necessary to consolidate collaborations networks with researchers from different countries, regions and institutions.
Sport innovation within enterprises and sport entrepreneurship are strong areas of research	More research about how other specific types of entrepreneurship could be embedded in sport entrepreneurship should be conducted. For instance: (1) social entrepreneurship, (2) transformational entrepreneurship, (3) corporate entrepreneurship
The majority of the samples used in the empirical studies are from one country or region	It is necessary to compare samples from different regions or countries to discover if the culture has an effect on entrepreneurship and if these results are replicable. This could be done by establishing networks of researchers where sport entrepreneurship is more developed (the USA, Australia, the UK and Spain).

in these areas to test the theoretical frameworks that have been developed in different contexts (countries and regions).

However, sport entrepreneurship is still a novel area of research that shows a growing tendency, but more research should be done to consolidate it. The research

networks are small and scarce, so further international networks between different countries and institutions are required to advance the knowledge in this field. Therefore, more intercultural research should be carried out to provide an overview of this phenomenon. Moreover, it will be necessary in the future to put more emphasis on how to develop social entrepreneurship within the sport context. In addition, another future research focus could be on corporate entrepreneurship within sport organizations and in sport sciences students. In addition, transformational entrepreneurship in sport is another topic that could be developed in this field.

Finally, in Table 6, the main “gaps” findings in the field of sport entrepreneurship are presented. Furthermore, some recommendations to consolidate and contribute to the development of the sport entrepreneurship field are exposed.

Disclosure statement

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