

TRAINING TO WORK ON SPORTS: BIBLIOMETRIC CHARACTERISTICS AND COLLABORATION NETWORKS

*FORMAÇÃO PARA ATUAÇÃO COM O ESPORTE: CARACTERÍSTICAS
BIBLIOMÉTRICAS E REDES DE COLABORAÇÃO* 

*FORMACIÓN PARA LA ACTUACIÓN CON EL DEPORTE:
CARACTERÍSTICAS BIBLIOMÉTRICAS Y REDES DE COLABORACIÓN* 

 <https://doi.org/10.22456/1982-8918.109936>

 **Jean Carlos Freitas Gama*** <jeanfreitas.gama@gmail.com>

 **Amarílio Ferreira Neto*** <amariliovix@gmail.com>

 **Wagner dos Santos*** <wagnercefd@gmail.com>

*Federal University of Espírito Santo. Vitória, ES, Brazil.

Abstract: The article aims to analyze the authors and research networks that have dedicated themselves, in the international academic environment, to studying professionals' training to work with sport in a non-school context. Of a quanti-qualitative and state-of-knowledge type, it is based on the precepts of critical-documental analysis and bibliometrics. Sixty-four articles from 25 different countries were mapped. There is a movement, albeit timid, indicating the search for internationalization, with articles published in other countries and collaborative networks among authors. Some characteristics of those collaborations are shown by joint publication, teaching disciplines in other institutions, academic events, institutional collaboration agreements, split master's and doctoral studies, postdoctoral advice, and dialogue with other areas of knowledge.

Keywords: Sports. Professional Training. Physical Education. Scientific Publication Indicators.

Received: 16 Nov. 2020
Accepted: 02 Mar. 2021
Published: 02 Apr. 2021



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eISSN: 1982-8918

1 INTRODUCTION

The presence of sport in social spheres is varied and wide. We understand that debates surrounding the sporting phenomenon must take into account its complexity and the interconnections that consequently pervade it, as sport is essentially broad (PUIG; HEINEMAN, 1991; BAILEY, 2005; TUBINO, 2006).

Brazilian review studies show that sport is related to Physical Education in the context of bodily practices, both in its actual doing and in the knowledge produced from those practices in academic contexts, in their dialogue with teaching in professional education (GONZÁLEZ, 2004; SAAD; REIZ; REIZ-REZER, 2010). However, initiatives to understand the specific field of education to work with sport in non-school contexts are still shy, especially literature review studies.

Laios (2005) pointed out the Greek educational system for coach training within PE higher education, coaching schools or international schools. In Spain, Izquierdo (2016) identified the existence of higher education for professionals who work with physical activity and sports. However, he pointed out unsettling scenario, as 38% of respondents (2,500 practitioners) work without initial training and many who do have academic education end up doing different jobs.

In Italy, Maulini, Aranda and Cano (2015) assessed whether higher education programs at Movement Science schools met the training needs of professionals who work with sports in the country (sports educators). A high number of participants (84.4%) considered that they did have the appropriate skills for their field of work.

Wang, Thijs and Glanzel (2015) analyzed the characteristics of international collaborations in Sports Science publications and their influence on citation impact. The authors highlighted that, until that moment, there were no bibliometric macro-level studies on international collaboration in the area. They see this movement intensifying and as necessary for the field.

Therefore, we ask: who are the authors who have been dedicated, at an international level, to discussing education for working with sports in non-school contexts? In which countries and institutions do they work? What is the impact of journals in which the studies circulate? How do these researchers establish internationalization processes and collaboration networks? These concerns led us to produce this study, considering that, in a bibliographic survey carried out on the main databases,¹ we have not found specific bibliometric analysis papers mapping such issues from our theoretical and methodological point of view, i.e. correlating professional training with specific work with non-school sport.

Therefore, this article analyzes which authors and research networks have focused on studying the training of professionals to work with sports in a non-school context within the context of international academic production.

2 METHODOLOGY

This is a quantitative-qualitative study mapping state-of-knowledge academic works (ROMANOWSKI; ENS; 2006; ANDRÉ, 2009) in journals in the area. It is based on the assumptions of critical-documental analysis (BLOCH, 2001) and the evidential

¹ Survey carried out on Web of Science, Scopus, SPORTDiscus, SciELO and IRESIE databases, with descriptors, refinement and temporal delimitation as presented in the methodology section of this study.

paradigm (GINZBURG, 2002). The study's timeframe covers 1979-2019. It was conducted after survey and selection of the studies analyzed (as per topic 3.2). This type of research enables us to establish an overview of what has been produced “[...] and an order that allows perceiving the evolution of research in the area, as well as its characteristics and focus, in addition to identifying the remaining gaps” (ROMANOWSKI; ENS, 2006, p. 41).

Specifically, state-of-knowledge studies describe the distribution of scientific works about a certain object through approximations between contextual elements and a number of other variables such as publication date, topics and journals (MOROSINI *et al.*, 2002). In this case, the journal is a source, enabling us to understand “[...] thematic predominance or recurrence and information about producers [...]” (CATANI; SOUSA, 1999, p. 11).

The study also employs bibliometric analysis through statistical techniques and software to understand aspects such as scientific communication, collaboration networks, and impact of articles and journals. This is a field of studies that enables a more detailed analysis of fundamental scientific and academic aspects in different areas of knowledge (CARNEIRO; SANTOS; FERREIRA NETO, 2020). Such procedures allowed us to present an overview of the main characteristics and the situation regarding the topics proposed for investigation.

For this, we performed two search efforts, namely: a) articles with descriptors in English on the Web of Science, Scopus and SPORTDiscus databases; b) articles with descriptors in Spanish on the SciELO and IRESIE databases. The consultation used the same descriptors in all databases, but with language adjustments, as specified in Tables 1 and 2. This was necessary for finding as many articles as possible on the object. Therefore, the selected papers were related to the topic based on their titles, abstracts and/or key words.

Table 1 – Use of descriptors in English in databases

Databases	Descriptors
Scopus Web of Science and SPORTDiscus	<i>Training “physical education” and sport and “higher education”</i>
	<i>Training “physical education” and sport and formation</i>
	<i>“Coach training” and sport</i>
	<i>“Coach education” and Sport</i>

Source: Prepared by the authors

Table 2 – Use of descriptors in Spanish in databases

Databases	Descriptors
Scielo and IRESIE	<i>“Formación de entrenadores”</i>
	<i>“Formación en educación física” and deporte</i>

Source: Prepared by the authors

We used the filters in each database to include only open-access articles that were available in their entirety. To help organize and manage data, we work with Mendeley software version 1.19.5.²

² “Software used to manage and share research documents. It was developed for desktop computers, and it is also available for online use” (YAMAKAWA *et al.*, 2014, p. 169).

The first search found 488 articles: 208 on SPORTDiscus, 189 on Scopus and 91 on Web of Science. After reading the titles, we obtained a first selection of articles organized in folders by Mendeley.

With descriptors in Spanish, we found 56 papers on SciELO and 291 on IRESIE, totaling 347 articles. With the help of Mendeley, we eliminated texts duplicated on different databases.

To refine our mapping, we read titles and abstracts, eliminating duplicates and marking those aligned to our object of study as favorites. Eventually **64 articles** were mapped.

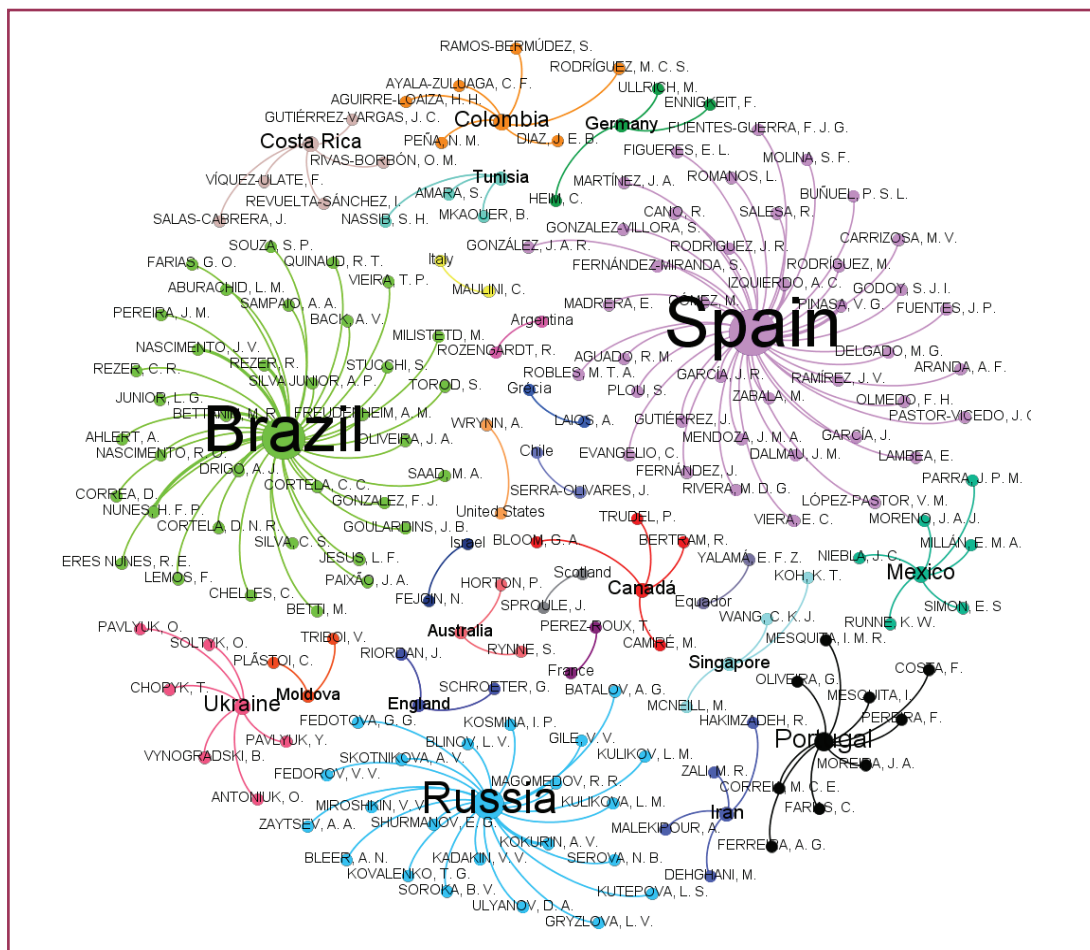
To present the results obtained after this first stage, we used Microsoft Excel 2010 and Gephi 0.9.2.,³ which helped us to create charts and figures.

3 TRAINING TO WORK WITH SPORT: UNVEILING THE LAYERS

3.1 AUTHORS AND THE COUNTRIES WHERE THEY WORK

Figure 1, produced on Gephi, shows the authors of the articles and the countries where they work, which, in most cases, also reflect their nationality. All authors included in the articles were considered to create this image.⁴

Figure 1 – Authors and the countries where they work



Source: Research data.

3 Gephi is an open-source network exploration and manipulation software. The modules developed can import, visualize, spatialize, filter, manipulate and export all types of networks (BASTIAN; HEYMANN; JACOMY, 2009).

4 Each journal has its own publication policy regarding the number of authors per article.

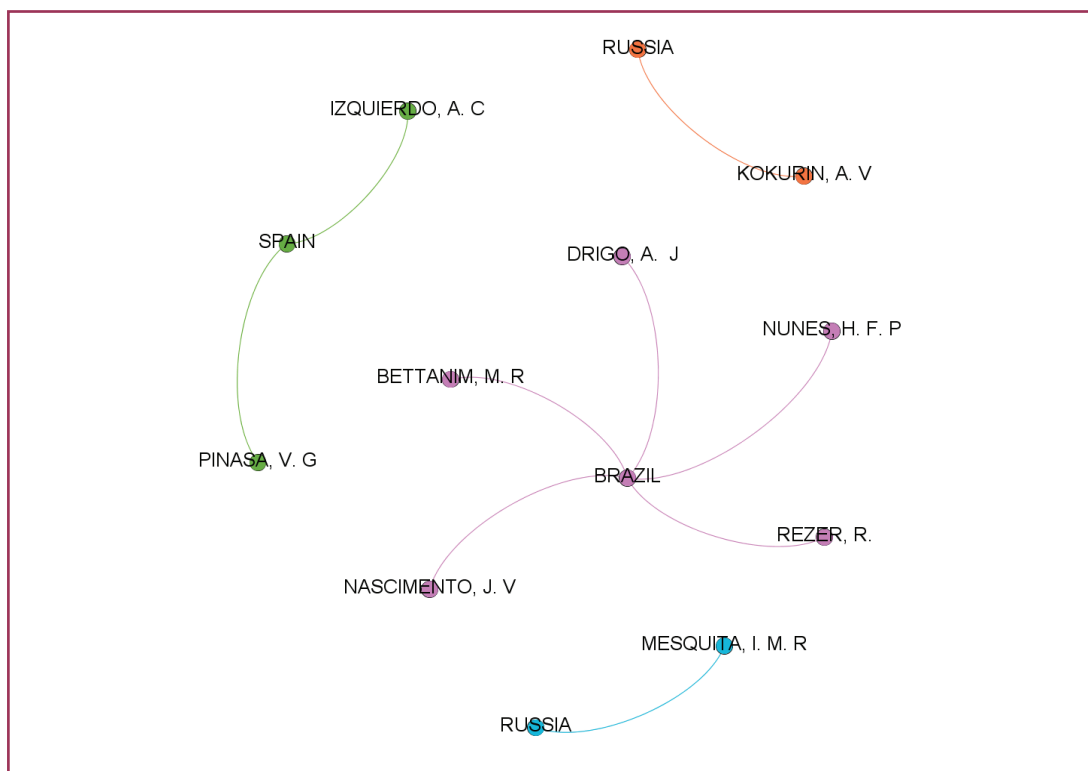
Figure 1 depicts the relationship between authors and countries through 25 clusters (different sets of colors representing countries), 187 nodes (countries and authors) and 162 edges (only authors). We see varied circularity of authors who work in different cultural contexts. Cluster sizes show that Spain has the most authors (40), followed by Brazil (35), Russia (22), Portugal (9), Mexico (6), Colombia (6), Ukraine (6), Costa Rica (5), Canada (4), Iran (4), Tunisia (3), Singapore (3), Germany (3), Australia (2), Moldova (2) and England (2). In addition to Israel, Argentina, Chile, Italy, Ecuador, Scotland, Greece, United States and France, all with one author each.

Authors from 25 different countries were found, spread over five continents (America, Asia, Africa, Europe and Oceania). These are clues that reveal a worldwide interest in issues related to sport and training. However, publications, partnerships and also research groups that intend to permanently study the topic have to be strengthened.

Furthermore, the view of science in each context and the unique nature of each area have to be considered, since they are reflected in research and dissemination practices. Despite the diversity of continents, authors from the Americas and Europe prevail,⁵ especially when we look at the journals where the research is published, but Asians are emerging, and authors and texts from Africa and Oceania are starting to appear, although still shyly.

Figure 1 also indicates a likely lack of consistency, as we saw a process of fragmentation in scientific production about training in sport. After applying a filter, we notice that few authors are repeated in more than one article. In all, they are nine, who are present in 13 articles, as shown in Figure 2:

Figure 2 – Authors present in more than one article and country of activity



Source: Research data.

⁵ Here we refer to the Americas as a whole, including North, Central and South America.

From Price (1986) and Alvarado (2009), through the law of elitism, we can infer that 5.5% of authors (9) make up the elite group that accounted for 20.3% of the works, that is, low production under the Price index.⁶

Therefore, two pieces of evidence point to a possible movement towards decentralization and diversification in research on the topic: a) the various authors with only one article published; and b) an elite that does not account for half of the literature. Thus, production on the specific topic of training and working with sport does not yet have a hardcore.

Some factors may indicate such pulverization and low concentration in articles. Therefore, it is necessary to explore whether there is continuity and tradition with studies on the topic by these authors, focusing on their inclusion/participation in possible collaboration networks/partnerships. It is also important to identify if they take part in research groups, if they work on internationalization of articles and if they carry out extracurricular activities in other countries and institutions.

3.2 IMPACT OF JOURNALS, PRODUCTION FLOW AND INTERNATIONALIZATION

To understand the dialogue between countries, international publications and research partnerships with joint authorship, first we need to look at the academic context and the impact of the journals where the articles were published.

These attributes are shown by indicators that measure journals' reach, demonstrating their weight in the scientific community through the impact of the number of citations of an article on the references of others (ROQUE, 2012; MUGNAINI, 2016).

We chose to analyze the scope and relevance of the 39 journals in which the 64 articles found on the database were published, observing their Impact Factors (IF)⁷ and *h*-index Google (*h*-index 5).⁸ Five journals in our survey had IF and 34 had *h*-index 5, as shown in Table 3 and Graph//Chart 1:

Table 3 – Journals with Impact Factors

Journal	Country	JCR – IF (2019)
<i>Sport, Education and Society (SEAS)</i>	England	1,962
<i>QUEST</i>	England	1,819
<i>Revista de Educación (REDU)</i>	Spain	1,783
<i>International Review for the Sociology of Sport (IRFSS)</i>	England	1,771
<i>Movimento (MOV)</i>	Brazil	0,365

Source: InCites Journal Citation Reports.

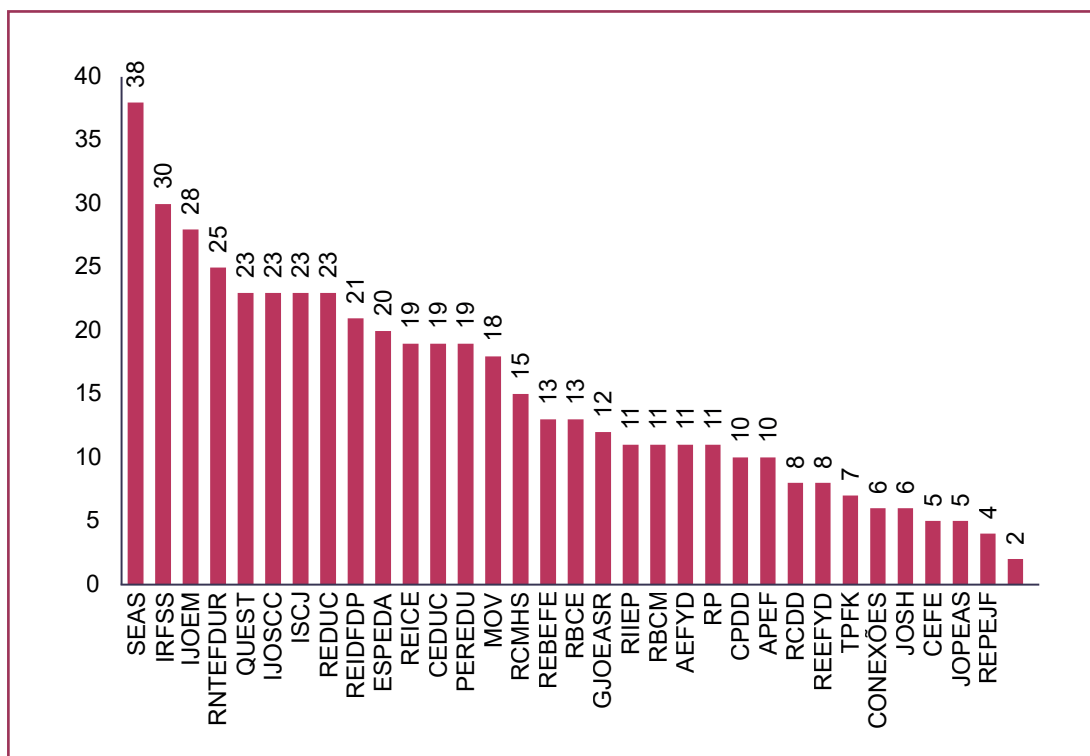
6 Price's law of elitism establishes that "[...] if k represents the total number of contributors in a discipline, \sqrt{k} would be the elite of the area under study as well as the number of contributors that make half of all contributions" (ALVARADO, 2009, p. 70).

7 The IF expresses the frequency of an article's citations in a given journal. The calculation takes into account two elements: the numerator – which is the number of citations in the current year to any items published in a journal in the previous two years; and the denominator, which is the number of articles published in the same period by the journal. (GARFIELD, 1999; ROQUE, 2012).

8 The IH5 is calculated over a five-year timeframe. It is defined by the highest number 'h' of articles published in that time that obtained at least the same number 'h' of citations. For example, if a journal publishes ten articles that have been cited at least ten times in other works, the H5 index will be 10. Currently, this indicator measures the production of researchers as well as that of journals and institutions (CÓZAR; CLAVIJO, 2013).

We observed that journals in Table 3 may represent an elite among the 39 found in our study. In addition, we consider that four of the five journals are in Europe and three are in England, showing the high impact of English journals for articles on sports.

Chart 1 – Journals with H5 Index



Source: Google scholar.

Table 3 and Chart 1 show that SEAS is still the journal of reference for both FI and *h*-index. In addition, IRFSS and QUEST (journals in the IF list) are also among the five with the highest *h*-indexes.

We also highlight that, only two of the journals that published the most articles on the topic are well ranked in impact indexes: MOV – since it has an IF – and International Sport Coaching Journal – with a *h*-index of 23. This reinforces the idea that there is still no hardcore of researchers and journals specifically focused on the topic of training for working with sport.

Wang, Thijs and Glanzel (2015) highlighted the importance of conducting bibliometric studies in the field of Sports Science in international contexts. For the authors, there is probably a connection in collaborations between countries and the impact of citations and journals on studies in the area. In addition, these metrics help us to analyze the correlation established between the object of study, the range and circulation of researchers who study it, the reach of their works, and those established as references (of journals, authors and groups).

As for production flow, the articles were published between 1979 and 2019, with a gap in 1995-2003, and then continued uninterruptedly from 2005 on. In addition, the number of publications increased between 2010 and 2019 (compared to the previous decades), with 46 articles published (71.9% of the total on the database), establishing

an average of 5.1, with variation of: minimum = 3 publications/year (2012, 2016 and 2019); and maximum = 9 publications/year (2017).

On the database, we also found 22 articles from 16 countries, with different countries of origin (where the study was conducted) and countries of publication (where the journal is located), pointing out the *traces* of possible internationalization processes. They were published in 16 journals from seven countries. English journals concentrated the most publications, with seven articles, followed by Romania and Brazil with four each, in addition to Spain, Chile and Colombia with two articles each, and Monaco with one article. The country that published the most articles of this type was Portugal, as well as one publication in England, one in Brazil and one in Colombia.

Based on Ginzburg (2002), we understand that this type of analysis is comparable to putting together a jigsaw puzzle in which the pieces (clues and signals) lead to a broader scenario that seemed unknown and silenced. “What characterizes this knowledge is the ability of, based on apparently negligible data, to refer back to a complex reality that cannot be experienced directly” (GINZBURG, 2002, p. 152).

Therefore, it is necessary to look into authors’ motivations to seek these countries, taking into account some *signals*, such as research content, their specificities for each context, the journals’ impact factors and indexation, researchers’ academic participation in collaboration and research groups, and their work history regarding the object of study.

England is a reference with 31.8% of works from other countries. In this case, it concentrates the journals with the highest IFs. The several countries resorting to English journals is yet another element that indicates the country’s comprehensiveness and tradition on the topic. Altogether, there are six countries from three continents.

Brazilian and Romanian journals received four works each, but they must be analyzed differently. In Brazil, journals are chosen according to national ranking (determined by Qualis) and impact. This factor was materialized in the search on journal *Movimento* (MOV), since it is the only Brazilian journal in the sample with an IF. In Romania, geographical and cultural proximity with the countries that published there has to be considered.

Another *trace* captured in these articles, and which can also be considered a determining factor in the search for a journal, is the exchange between same-language countries – for example, Mexican articles published in Spanish journals, Portuguese articles published in Brazil, and works from Argentina published in Colombia. Therefore, this process leads us to reflect on the different configurations of policies to promote research, publication and internationalization of each country’s academic production (GOULART; CARVALHO, 2008; SANTIN; VANZ; STUMPF, 2016).

3.3 COLLABORATION NETWORKS

In addition to studies published in other countries, it is also important to identify possible collaboration networks established in studies with authors from different institutions and nations, which indicates partnerships and comprehensive scientific exchange about the object. This can be seen in seven works, as shown in Table 4.

Table 4 – Articles with contributions by authors from other countries and authors' H-index

Article's title	Country where the study was conducted	Authors	Author's H index	Country where author works	Country of publication of the study
1 - The changing face of sport and Physical Education in post-colonial Singapore (2010)	Singapore	MCNEILL, M.	-	Singapore	England
		SPROULE, J.	32	Scotland	
		HORTON, P.	-	Australia	
2 - Initial and continuing training of tennis coaches in Parana state (2013)	Brazil	CORTELA, C. C.	-	Brazil	Brazil
		ABURACHID, L. M.	-	Brazil	
		SOUZA, S. P.	-	Brazil	
		CORTELA, D. N. R.	-	Brazil	
		FUENTES-GARCÍA, J. P.	16	Spain	
3 - Competences and college training of sport educators in Italy (2015)	Italy	MAULINI, C.	6	Italy	Chile
		ARANDA, A. F.	30	Spain	
		CANO, R.	55	Spain	
4 - The sport education model in Spain: a review of state the art and outlook (2015)	Spain	EVANGELIO, C.	4	Spain	Spain
		GONZALEZ-VILLORA, S.	23	Spain	
		PASTOR-VICEDO, J. C.	18	Spain	
		SERRA-OLIVARES, J.	13	Chile	
5 - Creation, implementation, and evaluation of a values-based training program for sport coaches and physical education teachers in Singapore (2017)	Singapore	KOH, K. T.	-	Singapore	England
		WANG, C. K. J.	45	Singapore	
		CAMIRÉ, M.	26	Canada	
		BLOOM, G. A.	39	Canada	
6 - The learner-centred status of a Brazilian university Coach Education Program (2018)	Brazil	MILISTETD, M.	12	Brazil	England
		NASCIMENTO, J. V.	30	Brazil	
		TRUDEL, P.	12	Canada	
		RYNNE, S.	20	Australia	
		MESQUITA, I. M. R.	-	Portugal	
7 - The surfing coaching: sources of knowledge acquisition (2018)	Portugal	CORREIA, M. C. E.	-	Portugal	England
		BERTRAM, R.	-	Canada	

Source: Research data

The year of publication of the articles indicates that this movement has been established in the last ten years. Carneiro, Santos and Ferreira Neto (2020)

demonstrate that these actions seem to show a global trend in which the growth of scientific intellectual production is influenced by the increase in collaborative networks and partnerships among researchers. This movement is also reflected in specific sub-areas (such as sports practice, adapted physical activity, sports rehabilitation, specific sports, etc.) and in the larger area of Sports Science (WANG; THIJS; GLANZEL, 2015).

We highlight two lines of analysis that can be worked on through Table 4, namely: a) studies with the same country of origin and publication but including partnerships between authors from other countries; b) studies with different countries of origin and countries of publication and contributing authors from different places.

The first line includes Articles 2 and 4 presented in the table – developed in Brazil and Spain, respectively. Despite including an author from another country, they partly materialize the idea of ‘domestic publications’ (WANG; THIJS; GLANZEL, 2015).

In Article 2, we found Spanish professor Juan Pedro Fuentes García, from the University of Extremadura, the only non-Brazilian author, who has an H index. The study focuses on continuing education of tennis coaches in Brazil. Looking at the authors’ institutional connections, we see that this article is probably the result of an inter-institutional partnership (between institutions and countries) promoted by the Paraná Tennis Federation (FPT) through its president Professor Silvio Pinheiro de Souza and its capacity-building director at the time Professor Caio Correa Cortela, the Federal University of Santa Catarina (UFSC) and University of Extremadura.

The *clues* captured lead us to *evidence* (GINZBURG, 2002) demonstrating that while the partnership between Brazil and Spain was specific, it contributed to form a collaborative network for conducting research with sports coaches and practice in Brazil, with tennis as its guiding thread.

Another *signal* is revealed when we realize that Professor Caio Cortela is a member of a project called ‘Elite Coach Development,’ led by Professor Michel Milistetd and including Professor Juarez Vieira do Nascimento – both from UFSC and authors of Article 6.

Still in Line 1, Article 4 presents yet another feature. It is a review study on Spain’s sports educational model, with exchanges between Spain and Chile that include Chilean professor Jaime Serra-Olivares, who carries out his post-doctoral studies at the University of Castilla-La Mancha, where the other three authors work.

In this case, the fact that all authors have H indexes indicates that there seems to be a more consolidated network of collaboration between them, whose guiding thread includes studies on education-sport, specifically football. We saw this movement when we found four more studies⁹ signed by at least two or three of the four authors of Article 4.

The first line of analysis shows us that other factors must be considered, such as researchers’ participation in events and lectures, their relationship with institutions

9 I - Soccer and relative age effect: a walk among elite players and young players; II - Sport education model and self-determination theory: an intervention in secondary school children; III - Game-based approaches’ pedagogical principles: exploring task constraints in youth soccer; IV - Review of the tactical evaluation tools for youth players, assessing the tactics in team sports: football.

and their history with the topic of the study, in order to identify any partnerships. Furthermore, these collaborations can be specific or long-lasting, depending on the rationality established by groups, researchers and institutions.

The dialogue with Wang, Thijs and Glanzel (2015, pp. 844-845) makes us realize another interesting feature in this internationalization process. They exemplify: “Some researchers find the collaboration tendency in specific sport topics, such as Spain tends to work with South America, and Iran prefers to collaborate with English-speaking countries [...]”.

This finding is confirmed in some examples that can be found in our data, both in Table 5, with the partnerships of Line 1 (Brazil x Spain; Spain x Chile), and in Table 4, with Iran’s work published in England, Spain’s in Brazil (two) and Mexico’s in Spain.

The second line of analysis in Table 5 includes five works from a variety of authors (17), nationalities (8) and countries where the studies were conducted (4). However, there is high concentration of publications in England (4 in all). In this case, the relationship between country and journal has to be taken into account, since a major feature consolidating collaboration networks is high quality production and consequent publication, internationalized in high-impact journals and in countries with tradition in the topic, such as England.

Articles 1 and 5, for example, show Asian countries’ opening to these processes both of collaboration and of publication in other countries. Yang, Liang and Xue (2018) point out that researchers’ international mobility is reflected in Asian authors, especially Chinese ones. For them, authors emigration enables partnerships in projects and co-authorship in works, which provides benefits to their countries of origin.

Article 1 shows that the partnerships took place through such a process. Analyzing Professor J. Sproule’s curriculum (according to h index and Open Researcher and Contributor – Orcid), we can see that he has already taught in Singapore in the project led by the British Council/Loughborough University, he advises doctoral students from other countries and provides consultancy and coach training for organizations such as the English Sports Council and Australian Sports.

An article from Singapore – published on SEAS and including authors from Scotland and Australia – is not produced unintentionally or by mere coincidence. Another factor reinforcing that view is that authors M. McNeill, P. Horton and J. C. K. Wang (author of Article 5, who is also from Singapore) appear as co-authors in J. Sproule’s curriculum in at least two works in the last five years.

Despite addressing different specific topics, Articles 1 and 5 are connected because they come from the same institution (Nanyang Technological University) and because of the network established between J. Sproule and C. K. J. Wang – the latter has the second highest h index in the sample (45) and works on Education. Also in Article 5, we see collaboration by Canadian authors M. Camiré and G. A. Bloom. They have partnerships in publications, student advising and projects on sports practice, educational models, and coach training with Professor Pierre Trudel, who is also Canadian and one of the authors of Article 6.

The role of research groups, projects, lines and researchers who lead and advise students in certain objects has to be understood. In our case, researchers in the field of Sports Science, from the Department of Human Kinetics at the University of Ottawa, establish partnerships with other countries. Article 7 also shows this, with the participation of Rachael Bertram – another author of that department.

In the example of Article 6, the network is the result of an international mobility action for master's and doctoral degrees by Professor Michel Milistetd. His Master's Degree in Sports Science – fully developed at the University of Oporto – was advised by Professor Isabel Maria Ribeiro Mesquita, while his doctoral studies were of the split type – at the University of Ottawa, advised by Professor Pierre Trudel, and at UFSC, advised by Professor Juarez Vieira do Nascimento.

Another factor of approximation is that the Brazilian authors of Article 6 are members of the Federal University of Santa Catarina's Center for Research in Sport Pedagogy (NuPPE). Furthermore, the inclusion of Australian Professor Steven Rynne, who has publications with other NuPPE¹⁰ members, reinforces this movement.

Yang (2020) helps us understand the configuration of science in an international scenario from the point of view of Chinese experiences. He stresses 'international mobility' processes among researchers and addresses the forms of research and training of scientists in different contexts around the world. He shows that international mobility has been boosted in the globalized academic world and that EU countries, for example, promote several measures to increase researchers' mobility, including joint publication, career development in research for professionals, and investment in exchanges and communication between countries.

This author also points out that scientists with high number of citations are mostly concentrated in industrialized and western countries such as the United States. In our case, the author with a *h*-index and, consequently, with greater reach and circulation, is Spain's Professor Rufino Cano González (*h*-index of 55). While Professor González is the researcher with the highest impact, he is from the Education area and his main lines of research are educational guidance and research methods in education. Thus, in Article 3 we see another important characteristic of the collaborations that reflects in the high-quality works and their international projection. It is about the dialogue between researchers in related fields.

Article 3 is peculiar, as it addresses research carried out in Italy in partnership with Spanish researchers and published in Chile. However, the author reinforces the argument of Wang, Thijs and Glanzel (2015) when they predict the trend towards dialogue between Spain and South American countries. That partnership takes place through the inclusion of Professor Claudia Maulini in the Doctoral Studies program at the Department of Pedagogy at the University of Valladolid,¹¹ where the other two authors work.

Based on these data, we observe the intentions that configure authorship profile in articles, with authors from different countries and institutions, and how they reveal

10 For example, article "Research review on coaches perceptions regarding the teaching strategies experienced in coach education programs", published in 2019, also as a partnership with Professors Vitor Ciampolini and Vinicius Zeilmann Brasil, both NuPPE members.

11 Data obtained by Orcid.

that these possible collaborative networks are established through broad processes. In the publications, the characteristics of the internationalization processes materialize various actions that determine how broad a network is.

[...] the international collaboration has also strongly intensified in sport sciences in the last decade. The growth rate of international co-authored publications exceeds that of domestic ones. Sport sciences researchers show various collaboration propensity and asymmetric collaboration willingness in various countries (WANG; THIJIS; GLANZEL, 2015, p. 859).

Each country, region, institution, group and researcher has its own rationality. Therefore, these components must be in synch and scientific policies have to be consolidated. We found more solid groups of researchers with transit in international collaboration of research in Sports Sciences in Canada, Spain, Brazil, United Kingdom and Singapore, as well as partnerships between institutions, such as the cases of the UK and Singapore, Brazil and Canada, Brazil and Spain, and Canada and Singapore.

We understand that advising students, developing research projects, establishing research groups, attending events, teaching courses, dialoguing with other areas, and the very transit of researchers need to be taken into account when analyzing these processes.

4 FINAL CONSIDERATIONS

We aim to analyze which authors and research networks have been dedicated, within the scope of international academic production, to studying the training of professionals to work with sport in non-school contexts. Our mapping found 64 articles published in 39 journals indexed in academic databases.

We found works from 25 countries in five continents with a diversity of authors, with only nine authors having published two papers. In addition, most of the works come from Brazil, Spain, Russia and England. We saw fragmentation in authorship and production of studies, which points to the need for continuity in academic work on the subject.

As for journals, England took the lead with significant concentration of journals with high impact rates and scientific capital for publications in Sports Sciences. While most publications are concentrated in their countries of origin, there is a – still shy – movement indicating dialogues in the search for internationalization, with articles published in other countries and collaborative networks.

This highlights the need to strengthen collaboration networks among authors from different countries and institutions, as well as scientific policies aimed at internationalizing the area and actions that materialize the process of networks, such as: a) joint publication in journals outside researchers' countries of origin; b) subjects taught by professors from other institutions and countries; c) academic events; d) institutional collaboration agreements; e) split master's and doctoral studies; f) advising postdoctoral students; g) exchanges, technical visits and scientific internships; h) establishment of research groups and lines; i) dialogue with related areas.

Therefore, our survey revealed the need to establish a field of discussions with continuity in research about training to work with sport in non-school contexts. Thus, we see the need for future studies that explore the topic, especially regarding the courses and different contexts that train these professionals.

REFERENCES

ALVARADO, Rubén Urbizagástegui. Elitismo na literatura sobre a produtividade dos autores. **Ciência da Informação**, v. 38, n. 2, p. 69-79, 2009.

ANDRÉ, Marli. A produção acadêmica sobre formação de professores: um estudo comparativo das dissertações e teses defendidas nos anos 1990 e 2000. **Formação Docente: Revista Brasileira de Pesquisa sobre Formação Docente**, v. 1, n. 1, p. 41-56, ago./dez. 2009.

BAILEY, Richard. Evaluating the relationship between physical education, sport and social inclusion. **Educational review**, v. 57, n. 1, p. 71-90, 2005.

BASTIAN, M.; HEYMANN, S.; JACOMY, M. Gephi: An Open Source Software for Exploring and Manipulating Networks. **Proceedings of the International AAAI Conference on Web and Social Media**, [S. l.], v. 3, n. 1, 2009.

BLOCH, March. **Apologia da história**: ou o ofício de historiador. Rio de Janeiro: Zahar, 2001.

CARNEIRO, Felipe Ferreira Barros; NETO, Amarílio Ferreira; SANTOS, Wagner dos. Redes de colaboração científica em Educação Física: comparação entre a subárea Biodinâmica do Movimento e a subárea Sociocultural e Pedagógica. **Em Questão**, v. 26, n. 3, p. 146-172, 2020.

CATANI, Denice Barbara; SOUSA, Cynthia Pereira de. O catálogo da imprensa periódica educacional paulista (1890-1996): um instrumento de pesquisa. In: CATANI, Denice Barbara; SOUSA, Cynthia Pereira de. (org.). **Imprensa periódica educacional paulista (1890-1996)**: catálogo. São Paulo: Plêiade, 1999. p. 9-30.

CÓZAR, Emílio Delgado López.; CLAVIJO, Álvaro Cabezas. Ranking journals: could Google scholar metrics be an alternative to journal citation reports and Scimago journal rank? **Learned publishing**, v. 26, n. 2, p. 101-114, 2013.

GARFIELD, Eugene. Journal impact factor: a brief review. 1999. **CMAJ**, v. 161, n. 8, p. 979-980, Oct.1999.

GINZBURG, Carlo. **Mitos, Emblemas, Sinais**: Morfologia e história. 2 ed. São Paulo: Companhia das Letras, 2002.

GONZALEZ, Fernando Jaime. O estudo do esporte na formação superior em Educação Física: construindo novos horizontes. **Movimento**, v. 10, n. 1, p. 213-229, 2004.

GOULART, Sueli; CARVALHO, Cristina Amélia. O caráter da internacionalização da produção científica e sua acessibilidade restrita. **RAC-Revista de Administração Contemporânea**, v. 12, n. 3, p. 835-853, 2008.

IZQUIERDO, Antonio Campos. A formação dos profissionais da atividade física e esporte na Espanha. **Movimento**, v. 22, n. 4, p. 1351-1364, 2016.

LAIOS, Athanasios. The educational system for training coaches in Greece. **International Journal of Educational Management**, v. 19, n. 6, p. 500-504, 2005.

MAULINI, Claudia; ARANDA, Antonio Fraile; CANO, Rufino. Competencias y formación universitaria del educador deportivo en Italia. **Estudios pedagógicos (Valdivia)**, v. 41, n. 1, p. 167-182, 2015.

MOROSINI, Marília Costa *et al.* **A produção científica sobre educação superior no Brasil: 1968-2000**. Porto Alegre: GT Política de Educação Superior/Anped, 2002.

MUGNAINI, Rogério. O Fator de Impacto: sua popularidade, seus impactos e a necessidade de preservação do processo de geração do conhecimento científico. **Revista da Escola de Enfermagem da USP**, v. 50, n. 5, p. 722-723, 2016.

PRICE, Derek John de Solla. **Little science, big science... and beyond**. New York: Columbia University Press, 1986.

PUIG, Nora; HEINEMANN, Klaus. El deporte en la perspectiva del año 2000. **Papers: revista de sociologia**, n. 38, p. 123-141, 1991.

ROMANOWSKI, Joana Paulin; ENS, Romilda Teodora. As pesquisas denominadas do tipo “estado da arte” em educação. **Revista Diálogo Educacional**, v. 6, n. 19, p. 37-50, 2006.

ROQUE, Vitor. Métricas da Informação: O Fator de Impacto na Prática. **Egitania Scientia**, n. 10, p. 177, 2012.

SAAD, Michel Angillo; REZER, Ricardo; REIZ-REZER, Carla. O ensino do esporte no processo de formação inicial em educação física. **Revista Didática Sistemica**, v. 11, p. 162-178, 2010.

SANTIN, Dirce Maria; VANZ, Samile Andrea de Souza; STUMPF, Ida Regina Chittó. Internacionalização da produção científica brasileira: políticas, estratégias e medidas de avaliação. **Revista Brasileira de Pós-Graduação**, v. 13, n. 30 p. 81-100, 2016.

TUBINO, Manuel José Gomes. **O que é esporte**. São Paulo: Brasiliense, 2006.

WANG, Lei; THIJS, Bart; GLÄNZEL, Wolfgang. Characteristics of international collaboration in sport sciences publications and its influence on citation impact. **Scientometrics**, v. 105, n. 2, p. 843-862, 2015.

YAMAKAWA, Eduardo Kazumi *et al.* Comparativo dos softwares de gerenciamento de referências bibliográficas: Mendeley, EndNote e Zotero. **Transinformação**, v. 26, n. 2, p. 167-176, 2014.

YANG, Fangjuan; LIANG, Zheng; XUE, Lan. An analysis on characteristics and impacts of Chinese highly cited researchers' transnational mobility. *In: 2018 Portland International Conference on Management of Engineering and Technology (PICMET)*. Honolulu: IEEE, 2018. p. 1-8.

YANG, Rui. Benefits and challenges of the international mobility of researchers: the Chinese experience. **Globalisation, Societies and Education**, v. 18, n. 1, p. 53-65, 2020.

Resumo: O artigo objetiva analisar os autores e as redes de pesquisa que têm se dedicado, no âmbito da produção acadêmica internacional, a estudar a formação de profissionais para atuar com o esporte em contexto não escolar. De natureza quantiquantitativa e do tipo estado do conhecimento, fundamenta-se nos preceitos da análise crítico-documental e da bibliometria. Foram mapeados 64 artigos de 25 países diferentes. Existe um movimento, ainda tímido, indicando busca da internacionalização, com artigos publicados em outros países e redes colaborativas entre autores. Algumas características das colaborações se evidenciam por meio de publicação conjunta, ensino de disciplinas em outra instituição, promoção de eventos acadêmicos, acordos de colaboração institucional, realização de mestrado e doutorado sanduíche, orientação de pós-doutorado e diálogo com outras áreas do conhecimento.

Palavras chave: Esportes. Formação Profissional. Educação Física. Indicadores de Produção científica.

Resumen: El artículo tiene como objetivo analizar los autores y las redes de investigación que se han dedicado, en el ámbito de la producción académica internacional, a estudiar la formación de profesionales para actuar con deporte en un contexto no escolar. Con carácter cuanti-cualitativo y del tipo estado del conocimiento, se fundamenta en los preceptos del análisis crítico-documental y de la bibliometría. Se mapearon 64 artículos de 25 países diferentes. Existe un movimiento, todavía tímido, que apunta a la búsqueda de la internacionalización, con artículos publicados en otros países y redes de colaboración entre autores. Algunas características de las colaboraciones se evidencian mediante publicación conjunta, enseñanza de disciplinas en otra institución, realización de eventos académicos, convenios de colaboración institucional, realización de maestrías y doctorados sándwich, orientación postdoctoral y diálogo con otras áreas del conocimiento.

Palabras clave: Deportes. Formación Profesional. Educación Física. Indicadores de Producción Científica.

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CONFLICT OF INTERESTS

The authors declare that this work involves no conflict of interest.

AUTHOR CONTRIBUTIONS

Jean Carlos Freitas Gama: conceptualization, data curation, formal analysis, methodology, writing, review and editing.

Amarílio Ferreira Neto: conceptualization, formal analysis, supervision, writing, revision and editing.

Wagner dos Santos: conceptualization, formal analysis, supervision, writing, revision and editing.

FUNDING

This work was not supported by any funding agency.

HOW TO CITE

GAMA Jean Carlos Freitas; FERREIRA NETO, Amarílio; SANTOS, Wagner dos. Training to work on sports: bibliometric characteristics and collaboration network. **Movimento (Porto Alegre)**, v. 27, e27017, Jan./Dec. 2021. Available at: <https://seer.ufrgs.br/Movimento/article/view/109936>. Accessed on [day] [abbreviated month]. [year]. DOI: <https://doi.org/10.22456/1982-8918.109936>

EDITORIAL RESPONSIBILITY

Alex Branco Fraga*, Elisandro Schultz Wittizorecki*, Ivone Job*, Mauro Myskiw*, Raquel da Silveira*

*Federal University of Rio Grande do Sul, School of Physical Education, Physiotherapy and Dance, Porto Alegre, RS, Brazil.