



# Physical Education and Inclusion: a Bibliometric Study

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## Abstract

The possibilities offered by the Physical Education (PE) subject in the educational setting are extensive and go well beyond the mere development of basic motor skills. Our society and schools are diverse and pursue sustainable development goals in which inclusion is a core factor in ensuring quality education. For this reason, the general objectives of this paper were to perform a bibliometric study about inclusion in PE and also to conduct content analysis. The bibliometric analysis studied the production, collaboration and impact of the publications. The content analysis studied the keywords used, methodological aspects, the contribution made by PE and the results. The search was performed in the *Scopus* database which yielded a total of 103 articles. The results in terms of output point to a major increase in the presence of scientific publications in journals in the social sciences over the last 10 years, mainly from countries such as the USA, Brazil and Spain. Most of these studies are collaborative, there being only one author working alone as a major producer. However, their impact quantified in terms of citations was scant. The content analysis revealed a majority of non-interventional studies with a predominance of qualitative methodologies in order to improve the competencies of students with special educational needs (SEN) and attitudes towards them in the primary and secondary stages. Generally speaking, adapted games from the games and sports block were used as PE resources to promote inclusion.

**Keywords:** school, sports, inclusion, bibliometrics.

## Introduction

Inclusion has become an issue of global interest in the social policies of many countries, beginning with the initial attempts at the integration of students with disabilities in the last century through to the pursuit of the highest possible personal development of students with Specific Needs of Educational Support (SNES) in a minimally restrictive setting. In 2015, the United Nations General Assembly approved the 2030 Agenda featuring the Sustainable Development Goals (SDGs). The fourth goal of a total of 17 referred to quality education and focused on inclusion. More specifically, its objective was: “Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all” (page 3). In turn and in order to accomplish this quality education goal, 10 targets were established, one of which pertained to the issue of “gender equality and inclusion”. As acknowledged, the aim was to “...ensure equal access to all levels of education and vocational training for the vulnerable, including persons with disabilities, indigenous peoples and children in vulnerable situations” (UNESCO, 2016, page 4).

In Spain, Rubio (2017) analysed the evolution of inclusion from the early attempts at providing care for students with a disability in the Moyano Law of 1857, via the establishment of disaggregated special education in the General Law of 1970 and on to the integration of special education in the single educational system as of the Organic Law on general organisation of the educational system (LOGSE, 1990). Currently, the Organic Law for the improvement of educational quality (LOMCE, 2013), in line with the proposals of the Organic Law on education (LOE, 2006), established that the governing principle of education is inclusion. As of this point, SNES are taken to include: students with special educational needs (SEN), those who join the educational system late, those with learning difficulties, those who come from disadvantaged social backgrounds, students with attention deficit hyperactivity disorder (ADHD) and high-ability (HA) students.

Likewise, PE is a subject that is included in the curriculum for the purpose of developing motor skills and promoting hygiene and health by creating habits. According to Arnold (1991), PE is a subject of interest to the educational setting due to the three educational dimensions of the activities that require movement. These three dimensions refer to learnings that can be obtained when aspects “about” activities that require movement are studied, in other words, theoretical knowledge, such as ways of working on muscle strength or aerobic endurance; activities that are learnt during or begin “in” the performance of physical activities, in other words practical knowledge, such as taking the right decision under

certain conditions of play, and finally learnings produced “through” activities that require movement, for example, the social values of self-improvement, respect and also other types of interdisciplinary knowledge.

From this standpoint, PE’s possibilities for achieving inclusion would seem to be evident. In this regard, Mosston and Ashworth (1993) established a spectrum of teaching styles in PE associated with three teaching techniques depending on the students’ degree of autonomy. In descending degrees of autonomy, they are student design, discovery and direct teaching by teaching staff. This last technique straddles five teaching styles, particularly the inclusion style which says there are different levels of execution of the same task (Molina, 1999), thus enabling everyone to participate and learn since all students receive a bespoke proposal in order to be able to work according to their needs.

Many publications have addressed the inclusion of students with SNES in recent years along with the opportunities offered by physical activity, sports and leisure time (Lizcano et al., 2018) in accomplishing this goal. Two general objectives were set. The first was to perform a bibliometric study about the inclusion of PE, and three specific objectives were defined to analyse production, collaborations and co-authorship and the repercussion or impact of the research. The second objective consisted of exploring the studies further, for which purpose four specific objectives were set: analyses of the keywords used, methodological variables, the influence of PE and the study’s results.

## Methodology

Bibliometrics provides quantifiable data about scientific activity pertaining to an object of study (Tomás-Gorriç & Tomás-Casterá, 2018), in this case PE’s possibilities for achieving the inclusion of students with SNES and the impact of these publications. The *Scopus* database was used as it is seen as the most comprehensive in terms of time coverage, the number of documents available by area (Hernández et al., 2016) and on account of its acknowledged prestige in the scientific domain.

The study involved five phases. The first phase consisted of establishing the search equation and the following keywords were used: “physical education” AND inclusion AND disability OR “special educational needs” AND school.

The second phase involved the selection of the documents that would ultimately be included in the study following an initial reading of the abstracts. The decision was taken not to apply any time filter, whereby results were

**Table 1***Indicators for the document content analysis.*

Methodological elements	Participants	<ol style="list-style-type: none"> <li>0. Unspecified students</li> <li>1. Non-university education students</li> <li>2. University education students</li> <li>3. Teaching staff</li> <li>4. Parents/guardians</li> <li>5. Specialists</li> <li>6. Students with SNES</li> </ol>
	Type of school	<ol style="list-style-type: none"> <li>1. Specific school</li> <li>2. Ordinary school</li> </ol>
	Educational stage	<ol style="list-style-type: none"> <li>1. Preschool</li> <li>2. Primary</li> <li>3. Secondary</li> <li>4. Pre-university</li> <li>5. Higher</li> </ol>
	Specific need for educational support	<ol style="list-style-type: none"> <li>1. SEN</li> <li>2. ADHD</li> <li>3. Specific learning difficulties</li> <li>4. HA</li> <li>5. Personal conditions or family history</li> <li>6. Late joining the educational system</li> </ol>
PE	Type of work	<ol style="list-style-type: none"> <li>1. Review article</li> <li>2. Instrument validation</li> <li>3. Trial</li> <li>4. Intervention analysis</li> <li>5. Book or chapter</li> </ol>
	PE content block	<ol style="list-style-type: none"> <li>1. Body schema and autonomy</li> <li>2. Motor skills</li> <li>3. Expressive skills</li> <li>4. Physical fitness and health</li> <li>5. Games and sport</li> <li>6. Activities in the natural setting</li> </ol>
	Types of Physical Activity	<ol style="list-style-type: none"> <li>1. Aerobic</li> <li>2. Anaerobic</li> <li>3. Mixed adapted games</li> <li>4. Paralympic programme</li> <li>5. Non-adapted sports skills</li> </ol>
Results	Results	<ol style="list-style-type: none"> <li>1. Competencies</li> <li>2. Learnings</li> <li>3. Education in values</li> <li>4. Student motivation</li> <li>5. Attitudes, perceptions or beliefs</li> <li>6. Respect for and appreciation of diversity</li> <li>7. Inclusion</li> <li>8. Self-concept or self-efficacy</li> <li>9. Curriculum design</li> </ol>

Source: own compilation.

obtained from 1993 to 2019 through the analysis of the documents published in the last 25 years. According to Bordons and Zulueta (1999), analysing the output in an entire scientific area is interesting, although an analysis of the areas of study from which the question is being addressed was deemed useful. Of the 109 documents emerging from the search, reading the title and the abstract of each one led to six being ruled out for not fulfilling the study's objectives, leaving a total of 103 documents for the analysis. The third phase involved the analysis of the data based on the preparation and completion of a data record with the key information from each of the documents selected. The fourth phase consisted of considering the emergence of findings. The last phase involved the analysis of content depending on the most frequent words and the relationships between them, as well as a review of the key elements of each of the documents, allowing us to explore the relationship between PE and inclusion on a deeper level.

### Data analysis

The bibliometric analysis was performed on the basis of the indicators established by Aleixandre (2010), distinguishing between the indicators of production, collaboration, and repercussion and impact. For the output study, the publications were analysed according to: areas of knowledge, articles published per year, type of documents, by-country productivity, publication language, higher education institutions and the most outstanding journals. Collaboration in the publications was analysed depending on the number of authors and by-author productivity. Finally, the repercussion and impact of the publications was analysed based on the number of citations received.

Furthermore, the content analysis studied the keywords, methodological aspects, results and the influence of PE. With regard to the keywords, the terms used, their frequency and co-occurrence were analysed. The methodological aspects analysed were the sample, type of school, educational stage, type of SNES and finally type of work. The contribution of PE was analysed on the basis of content blocks (LOMCE, 2013) and the type of physical activity performed. Finally, the results obtained were analysed. A data record was drawn up showing the variables regarded as relevant by two researchers as well as the categories included by each one of them, yielding a total of eight variables (Table 1).

A Cohen's Kappa test was performed to analyse the inter-subject reliability of the coding of the content variables for each variable from 10% of the texts selected at random, resulting in scores above 0.967 for all of them which is regarded as a very high level of agreement (Altman, 1991,

p. 404). Finally, VOSviewer (Van Eck & Waltman, 2011) was used to build and display the co-occurrence maps graphically and WordArt tools for building the word clouds.

## Results

This section is divided into two analyses: the bibliometric analysis and the analysis of the content of the documents selected for the study.

### Bibliometric analysis

#### Production analysis

With regard to the areas of knowledge addressing this topic, the social sciences (34.2%) and the health sciences (29%) were particularly predominant over other areas such as medicine (18.7%), psychology (10.9%) and the arts (2.6%). In terms of scientific productivity based on the data for the number of articles published, the results obtained in the last decade warrant particular mention (Figure 1). This analysis allows us to ascertain the frequency of publication on this topic, the evolution of interest in the subject studied and the general trend over time. Of the 103 documents published between 1993 and 2019, the number of publications has grown in recent years, particularly since 2009 which accounts for 84% of the output analysed.

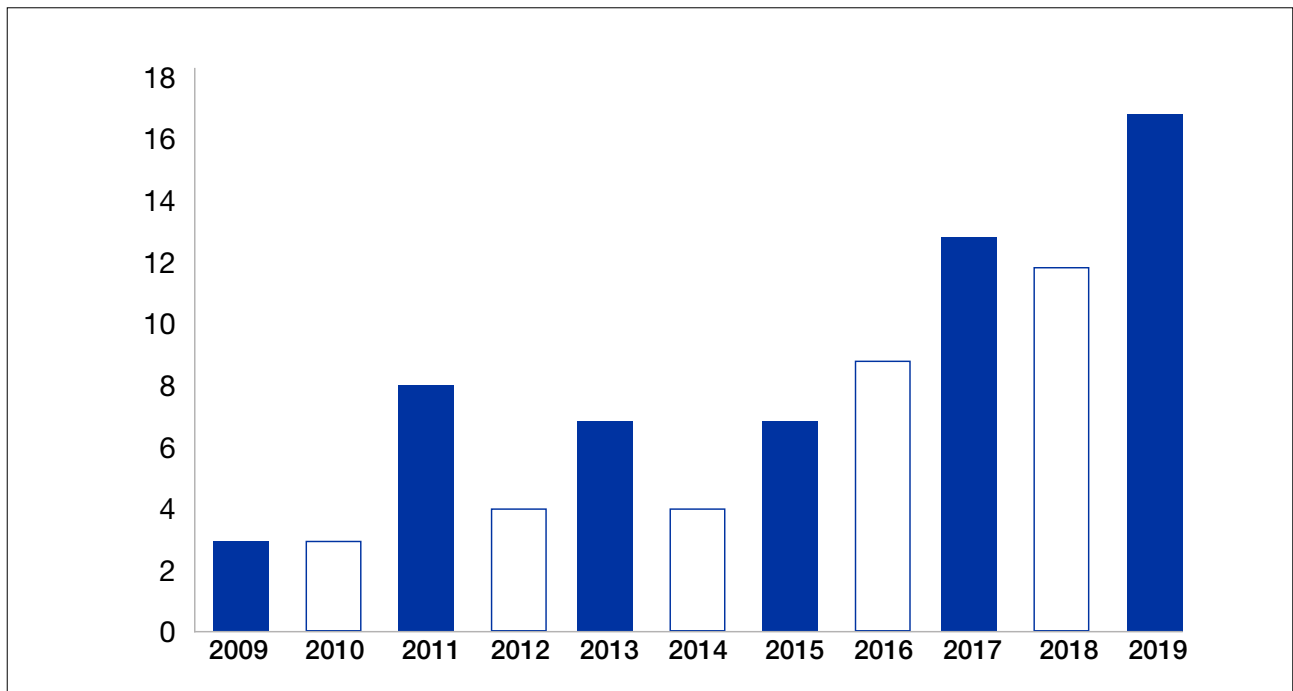
With regard to type of documents, the majority (93.2%) are articles. There are major differences in each country's bibliometric size, the largest being the USA with 36 texts (35%), Brazil with 18 articles (17%), followed by Spain with 14 documents (14%) and the United Kingdom with 11%. Therefore, the leading countries in this field come from both the American and European continents, although this topic is addressed from different geographic areas as can be seen in Figure 2, which shows the countries with more than one publication in the field of inclusion based on PE.

In terms of publication language, and as occurs in other bibliometric studies, the bulk are published in English (81%) with a low number of publications in Portuguese (12%) and in Spanish (9%). In this case, there are also documents in languages that are somewhat infrequent in other research conducted from this same standpoint such as Croatian or Lithuanian, each of which accounts for 1% of the total.

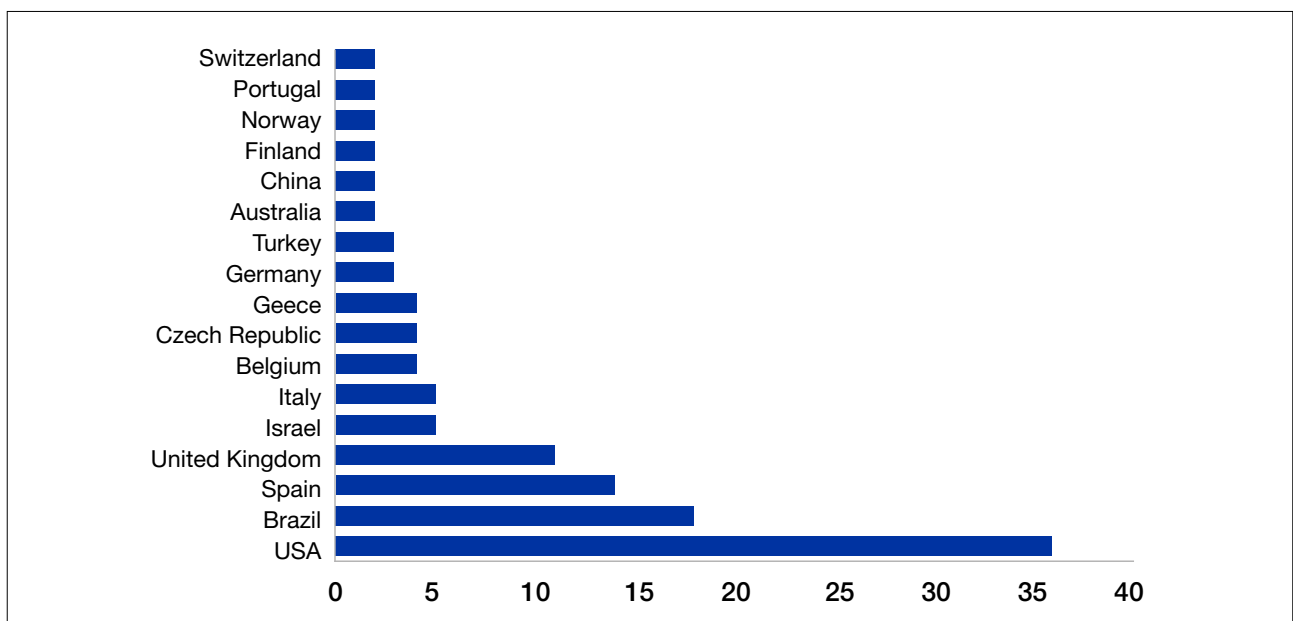
The higher education institutions with the greatest number of publications abroad are the University of Virginia (Hodge et al., 2017) and Ohio State University (Haegele & Zhu, 2017). In the Spanish setting, the main producers are Miguel Hernández University (Reina et al., 2019), the

University of Castilla la Mancha (Abellán et al., 2018), the University of Santiago de Compostela (Varela et al., 2019), the Polytechnic University of Madrid (Ocete et al., 2017) and the University of Valencia (Moya-Mata et al., 2017).

Moreover, the most prominent journals include *Adapted Physical Activity Quarterly*, *Physical Education and Sport Pedagogy*, *the Revista Brasileira de Educação Especial and Sport*, *Education and Society*.



**Figure 1** Number of articles per year.  
Source: own compilation from information from Scopus.



**Figure 2** Number of publications per country.  
Source: own compilation from information from Scopus.

## Collaboration analysis

In terms of collaboration and co-authorship, a total of 160 authors were involved in the 103 documents selected, meaning that the index of collaboration in this field is high. Table 2 shows the results of the number of co-authorships per document, making it possible to identify the collaboration networks generated in the scientific community with regard to the PE-Inclusion pair.

As can be seen, 87% of the scientific output was written on a collaborative basis. Of the total, 36% was written by more than three authors; here particular mention may be made of Alves et al. (2017), who analysed teaching staff's perception of the concept of inclusion and the benefits and drawbacks encountered in the implementation of inclusion in their classrooms, with a total of eight authorships.

Turning to the number of works involving the same author, for which purpose Lotka's law of scientific productivity was used, there was a predominance of occasional producers (96%) with one, two or three texts per author, medium-sized producers (2.5%) and only one large producer (0.6%), Martin E. Block (Table 3).

**Table 2**  
Collaboration and numbers of authorships.

Number of authorships	<i>n</i>	%
One	13	13 %
Two	20	19 %
Three	34	33 %
Four	17	17 %
Five	10	10 %
More than five	9	9 %

Source: own compilation.

**Table 3**  
Distribution of production.

No. of documents	Authors-hips	% n=	Lotka
1	123	76.9 %	Occasional producers
2	28	17.5 %	Occasional producers
3	3	1.9 %	Occasional producers
4	1	0.6 %	Medium-sized producers
5	1	0.6 %	Medium-sized producers
6	2	1.2 %	Medium-sized producers
13	1	0.6 %	Large producer

Source: own compilation.

## Analysis of the repercussion or impact of the research

In terms of the impact of the documents analysed, measured by means of the number of citations received (Table 4), it transpires that almost one third of the publications had no citations, one third had between one and five citations and 15% had between six and 10, thus reflecting the low impact of most of the research, which may also be accounted for by the fact that many of these publications are recent. Nevertheless, there are 12 articles with more than 100 citations, such as the one by Morley et al. (2005) which addresses the question of the inclusion of students with SEN from the standpoint of the secondary school teacher.

**Table 4**  
Number of citations received.

Citations	<i>n</i>	%
None	29	28 %
1 – 5	33	32 %
6 – 10	15	15 %
11 – 15	8	8 %
16 – 20	6	6 %
More than 20	12	12 %

Source: own compilation.

## Content analysis

With regard to the content of the 103 documents, the keywords, methodological aspects, the influence of PE and results were analysed. In order to analyse the methodological aspects, the influence of PE and the results, categories were established before the documents were read by two researchers independently so as to subsequently, and following an initial reading of these documents, reach a consensus on the categories that would ultimately be included in the analysis (Table 1).

## Analysis of the keywords

First of all, the keywords were identified, amounting to a total of 160 different words. Figure 3 shows these words and their weight in the documents analysed. The high degree of confidence of the words used by the research teams is noteworthy.

Secondly, Table 5 presents the terms used most frequently.

Finally, Figure 4 shows the map of co-occurrence of the keywords that reflects the relationships between the terms and their tendency to appear together. Three clusters



**Figure 3** Most frequent keywords.  
Source: own compilation with WordArt.

**Table 5**  
Most frequent keywords.

Keyword	N	% n = 137
Physical Education	65	47 %
Inclusion	45	33 %
Disability	30	22 %
Special Educational Needs	15	11 %
Attitudes	10	7 %
Physical Education and training	9	6.5 %
Special Educational	8	5.8 %
Sport	8	5.8 %
Integration	7	5 %
Intellectual Disability	7	5 %

Source: own compilation based on VOSviewer data.

may be distinguished. The main one is comprised of 12 terms such as disability, education, handicap and teaching. The second cluster includes 11 words such as inclusive education, learning difficulties, educational support, primary education, professional development, teaching staff and SEN. Finally, the third cluster includes five terms such as attitudes, integration and school. Therefore the context, subject, actors concerned and perceived benefits are represented.

### Analysis of the methodological aspects

Major diversity was observed in the type of research and, in ascending order of frequency, review studies (4.9%), instrument validations (9.7%) (Haegele, 2019) and intervention descriptions (17.4%) were obtained. In the studies in which no interventions were performed there was a predominance of quantitative (37.9%) over quantitative (19.4%) methodologies. As for the stages in each research document, it is telling that most of the studies focused on the primary (26.2%) and secondary (28.2%) stages.

With regard to the SNES presented by the participants, it is noteworthy that the participants had SEN in 78.6% of the documents. In terms of the type of schools, a small percentage of the studies (2%) was conducted in special education schools versus a majority in conventional schools (62.1%).

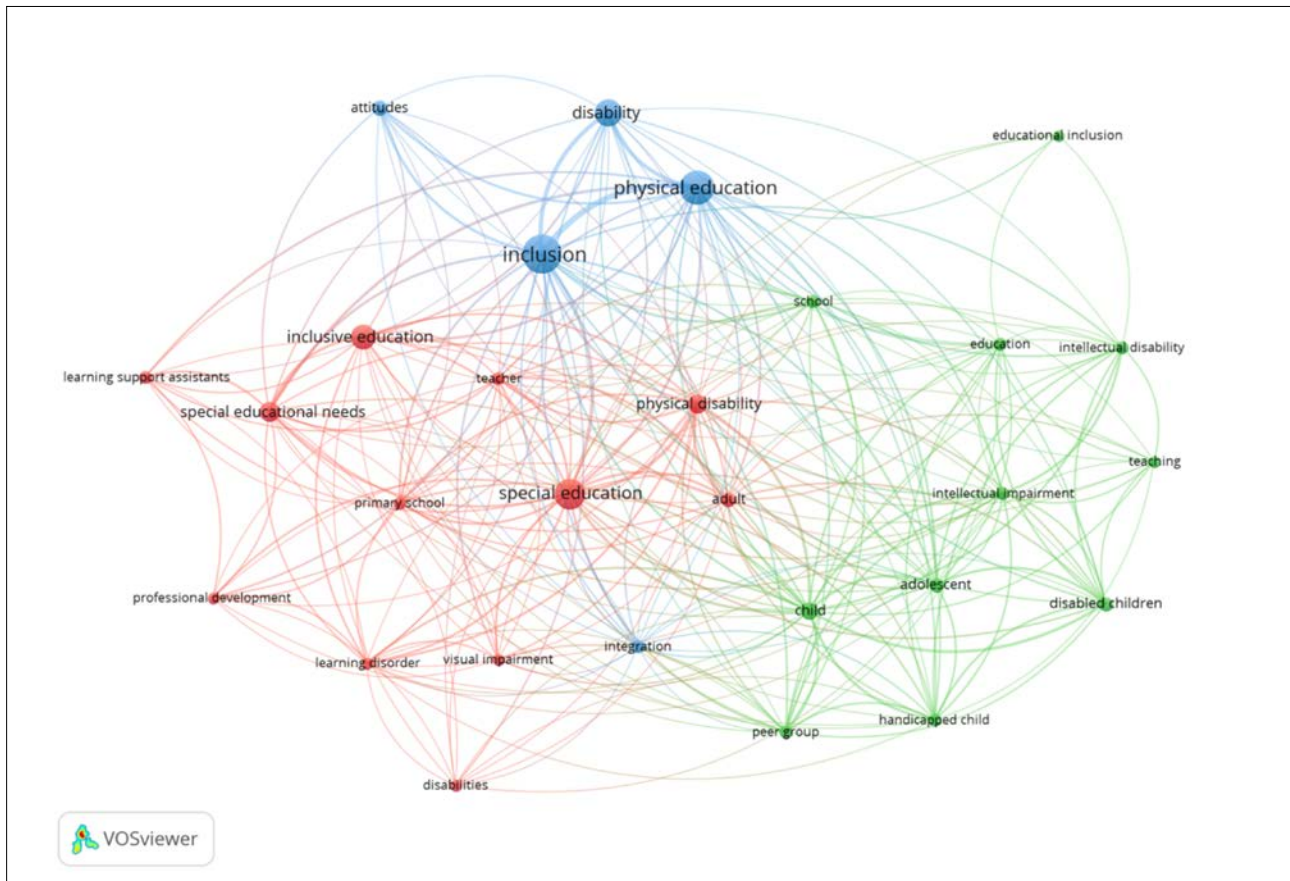
### Analysis of the contribution of PE

Content block could only be ascertained in 3% of the articles, all of which referred to games and sports. Of the studies, 67% stated that they had been performed in the secondary stage using a qualitative methodology based on interviews with specialised staff. The results indicated contributions for improving learning, competencies and self-concept as well as respect for and appreciation of people with SNES.

Physical activity was only extracted in 12% of the articles, in which 8% of the type of physical activity performed was aerobic for pre-university students with SEN. An intervention was performed leading to improvements in students' motivation for PE.

Likewise, 67% of the studies used mixed adapted games or exercises. Of these studies, 63% analysed primary and secondary students in equal proportions. Moreover, 75% of the studies involved students with SEN, with qualitative research (50%) predominating slightly over quantitative research (38%). The results indicated contributions for improving learning, competencies and self-concept, albeit with greater incidence on respect for and appreciation of people with SEN.

Furthermore, a Paralympic programme was conducted with primary students in 12% of the studies. An intervention was performed and the results indicated greater respect for and appreciation of students with SEN. Finally, 17% of the studies were conducted half and half in primary and secondary education by giving questionnaires to the students. The results indicated greater learning and competence as well as an increase in respect for and appreciation of students with SNES.



**Figure 4** Term co-occurrence map.  
Source: VOSviewer.

### Analysis of the results obtained

Finally, and in terms of results, most of the studies focused on studying inclusion strategies (68.9%); in second place analysing the attitudes, perceptions or beliefs of students and teaching staff with respect to students with SEN (38.8%); and thirdly the results focused on the improvement of competencies (26.2%) and learnings (31%) of both teaching staff and students. One out of every 5 articles addressed respect for and appreciation of diversity, and one in every 10 analysed the improvement of self-concept. Curriculum design (6.7%), education in values (3.8%) and student motivation (2.9%) were the least addressed results. Of all the texts analysed, the studies by Haycock and Smith (2010) and Morley et al. (2005) obtained the most extensive results.

### Discussion

The primary objective of this paper was to perform a bibliometric study about inclusion in PE. The bibliometric analysis was structured into three specific objectives in order to study output, collaboration and impact in the

studies. In terms of output, the social sciences enjoyed particular prominence, coinciding with the results of Sola-Martínez et al. (2020) in a study on teacher training and educational quality. There was continuous growth with output increasing in the last decade, as also noted by González-Zamar and Abad-Segura (2020) in their research about the university educational setting. Countries such as the USA, Brazil and Spain, and therefore English, Portuguese and Spanish, stood out as they did in other recent studies (Abad-Segura et al., 2020; Hinojo et al., 2019).

Moreover, the degree of collaboration was high, as was also observed in the study about gamification (Peirats et al., 2019), and most of the authors were occasional, as in the study by Cabrera (2020). The Lotka index was used, yielding similar findings to those obtained in a study about motivation in the educational setting (Campos et al., 2020). Finally, impact as evaluated by means of the number of citations received was low, coinciding with other bibliometric studies in the area of sports (Blanca-Torres et al., 2019).



The second objective consisted of analysing content in terms of keywords, methodological aspects, the subject of PE and the results obtained. The main keywords were *physical education, inclusion and disability* which coincide with the search terms, as is also the case in other bibliometric studies (Moreno, 2019). Methodologically, there were more studies in the primary and second stage, perhaps because of the greater availability of teaching staff for research purposes, and the main protagonists (participants) were students with SEN, denoting implementation of the SDGs (2030). Qualitative methodologies prevailed, probably due to the ease of holding interviews with teaching staff and specialists as compared to the authorisations required to administer questionnaires to students. The analysis of the influence of PE pointed to a greater use of adapted games, probably because games are the content in this subject that most motivates students in general (Castro et al., 2006). Finally, the results of the studies contributed improvements for inclusion strategies (Marques et al., 2013), attitudes towards students with SEN (Hernández et al., 2011; Nieva & Lleixà, 2018) and the improvement of their competencies and learnings, the objectives of most of the studies.

The main limitations are the scant percentage of papers that provide information about the type of physical activity performed or the PE content block.

With regard to future research lines, further work is called for on the differences between contents in this area that are particularly conducive to or may hamper inclusion, and also scheduling based on universal design for learning (UDL) and its application to the different educational stages. In this respect, the level of inclusion should be compared according to the use of games and sports with a competitive as opposed to a cooperative approach, as well as other PE content blocks.

## Conclusions

The main conclusions of this study are that the social sciences are the predominant area of research and that most output has been produced in the last ten years, particularly in countries such as the USA, Brazil and Spain. Most of the articles were written in collaboration, although major producers were somewhat scarce and most of the research had a relatively low impact.

The content analysis revealed a predominance of qualitative studies focusing on students with SEN. There was a major use of adapted games on account of the benefits they deliver for learning and development of competencies of students with SEN as well as for improving positive attitudes among other students towards diversity and inclusion.

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