

Bibliometric analysis of studies on attitudes towards disability and inclusion in physical education teachers

Análisis bibliométrico de los estudios sobre actitudes hacia la discapacidad e inclusión en profesores de educación física

*Luisa Gámez-Calvo, *, **, ***José M. Gamonales, *Víctor Hernández-Beltrán, *Jesús Muñoz-Jiménez

*Universidad de Extremadura (España), **Universidad Francisco de Vitoria (España), ***Universidad a Distancia de Madrid (España)

Abstract. The Inclusive Education model is defined as a teaching model that advocates equal opportunities for all students, especially those with disabilities or specific requirements. The significance of the teacher's attitude toward disability and inclusion is essential in the Inclusive Education process, requiring a comprehensive and up-to-date meta-analytical study that offers a panoramic view to the scientific and educational communities. This can be achieved through a bibliometric approach that analyzes data and metadata from existing specialized articles. This article provides an empirical overview of studies on attitudes toward disability and inclusion in physical education teachers. The extracted articles were examined using a bibliometric approach, leveraging data from 161 records stored in the Web of Science database from 1995 to September 2023, while applying traditional bibliometric principles and employing VOSviewer for data and metadata processing. Among the results, these articles highlight an exponential increase in scientific production over the last two decades, with a concentration in only 17 specific journals. The dominance of the USA and Spain within co-authorship networks of global relevance is evident, along with thematic and temporal distinctions within the concepts under examination. This current bibliometric analysis underscores the prevailing trend in research regarding inclusion, primarily through the development of interventions and educational programs addressing attitudes toward disability. As one of the primary means of enhancing attitudes toward individuals with disabilities in the field of education, specific training programs and the promotion of activities in which participants can experience and learn about disability hold significant importance.

Keywords: Inclusive Education; Attitudes; Disability; Inclusion; Physical Education.

Resumen. El modelo de Educación Inclusiva se define como un modelo de enseñanza que aboga por la igualdad de oportunidades para todos los estudiantes, especialmente aquellos con discapacidad o necesidades específicas. La trascendencia de la actitud del docente hacia la discapacidad y la inclusión es fundamental en el proceso de Educación Inclusiva, requiriendo de un estudio meta-analítico integral y actualizado que ofrezca una visión panorámica a la comunidad científica y educativa. Esto se puede lograr mediante un enfoque bibliométrico que analice datos y metadatos de artículos especializados existentes. Este documento proporciona una visión empírica de los estudios sobre las actitudes hacia la discapacidad y la inclusión en los profesores de educación física. Los manuscritos extraídos se examinaron utilizando un enfoque bibliométrico, aprovechando los datos de 161 registros almacenados en la base de datos Web of Science desde 1995 hasta septiembre de 2023, aplicando principios bibliométricos tradicionales y empleando VOSviewer para el procesamiento de datos y metadatos. Entre los resultados, estos documentos destacan un aumento exponencial de la producción científica durante las últimas dos décadas, con concentración en sólo 17 revistas específicas. Es evidente el predominio de Estados Unidos y España dentro de redes de coautoría de relevancia global, junto con distinciones temáticas y temporales dentro de los conceptos bajo análisis. Este análisis bibliométrico actual subraya la tendencia predominante en la investigación sobre la inclusión, principalmente a través del desarrollo de intervenciones y programas educativos que aborden las actitudes hacia la discapacidad. Como uno de los principales medios para mejorar las actitudes hacia las personas con discapacidad en el campo de la educación, los programas de capacitación específicos y la promoción de actividades en las que los participantes puedan experimentar y aprender sobre la discapacidad tienen una importancia significativa.

Palabras clave: Educación Inclusiva; Actitudes; Discapacidad; Inclusión; Educación Física.

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Luisa Gámez-Calvo

lgamezna@alumnos.unex.es

Introduction

The Inclusive Education model (IE) can be defined as a teaching model that defends equal opportunities for all students, particularly for those with disabilities or specific requirements (Erkilic & Durak, 2013). Therefore, IE refers to all processes that are developed to eliminate or minimize barriers that limit the active participation and learning of all students, incorporating cultural, social, practical, and political dimensions (Ainscow & Booth, 2015). The IE model assumes the achievement of quality education for all students, offering special attention to the needs of those in vulnerable situations, nevertheless it is important to consider that all students require different attention, since everyone has different capacities, learning pace and needs

(Gamonales, 2016; Montenegro-Rueda & Fernández-Cerero, 2023). An active and positive attitude towards disability and diversity is the starting point for a successful IE process (Hernández-Beltrán et al., 2023a).

The initial definition of attitudes encompassed cognitive, affective, motivational, and behavioural components, it is defined as "a mental and neural state of readiness, organized through experience, exerting a directive and dynamic influence upon the individual's response to all objects and situations with which it is related" (Gilbert et al., 1998). Consequently, the teacher attitude can be defined as the set of perceptions, beliefs, and feelings about the teaching-learning process of all students (Granada et al., 2013). Consequently, one of the main ways to improve attitudes towards people with disabilities in the educational field is the

promotion of activities in which the participants can experience and learn about disability, being the Physical Education (PE) subject an ideal area, due to their enabling features towards these inclusion projects (Ocete-Calvo et al., 2015; Reina et al., 2016). In addition, in IE projects, it should be considered that direct contact with the full and active participation of students with disabilities, reduces discrimination and prejudice towards diversity (Ocete-Calvo et al., 2015). The success of IE model depends largely on the attitudes of teachers, families, and peers, even when curricular adaptations are properly developed (Arias-González et al., 2016). Consequently, the key for success in the IE model is the teacher's attitude, being the inclusion term largely debated in the educational field (Hernández-Beltrán et al., 2023a).

Regarding the teacher's attitude towards disability, it has been studied in the scientific community, developing an exhaustive analysis about the components that influence the teacher's attitude, carried out in different contexts and educational levels, finding significant differences between them (Domingo et al., 2019; Huete, 2017; Monjas et al., 2014). Some researchers conclude that the most trained teachers indicated that the current educational curriculum is not the appropriated one for develop an IE methodology, as it is a rigid academic document (Domingo et al., 2019). In addition, the educational level that shows more conformity is Elementary and Primary Education, as it presents a greater academic training for teachers, and differences between students are still not relevant, however, the Secondary Education Level shows the lack of training of the teachers and the marked differences among students (Granada et al., 2013). Teaching attitudes are determined by different factors that facilitate or hinder the IE process, these factors are the teaching experience, the student's characteristics, the support and time resources, and the teacher's education and training (Granada et al., 2013; Hernández-Beltrán et al., 2023b). Therefore, in the PE area, the existing research shows that the adaptations and teaching agreements developed have mostly an integrative approach and not an inclusive methodology, because of the lack of specific educational training of the teachers and the lack of access to adequate materials and facilities (Hodge et al., 2018). Although there appears to be a general improvement in attitudes toward disability currently, there still exists a wide diversity of opinions, teachers who exhibit positive attitudes toward inclusion in the classroom promote the integration of students with or without disabilities at the Early Childhood Education and Primary Education levels (Angenscheidt & Navarrete, 2017). Additionally, teachers' attitudes and self-efficacy are considered the most important parameters for fostering and developing inclusion in the classroom (Jovanović et al., 2014). However, negative attitudes toward Inclusive Education in the conventional classroom stem from the difficulty of making curriculum adaptations for this group. The more complex these adaptations are, the more unfavourable attitudes teachers develop toward the inclusion of students with special educational needs and

disabilities in the classroom, leading to situations of segregation and separation of students (Fernández-Batanero, 2013; Polo-Sánchez & Aparicio-Puerta, 2018; Polo-Sánchez & Heredia-Alonso, 2020). Thus, the inclusion of students with special educational needs and disabilities in the regular classroom is paramount, without providing special attention unless strictly necessary (Polo-Sánchez & Heredia-Alonso, 2020). Therefore, to promote a positive climate toward inclusion, cooperative activities should be developed to increase student involvement in task development (Fernández-Rivas & Espada-Mateos, 2017). Furthermore, attitudes are not innate but develop throughout life. Therefore, it is essential to install values education in early stages, as individuals exhibit greater plasticity and absorption in terms of learning during these periods (Nowicki, 2006).

The general aim of this study is to analyse the interest and scientific evolution of studies on attitudes towards disability and inclusion in physical education teachers, through a bibliometric analysis. Thus, the importance of the teacher's attitude towards disability and inclusion being essential in the IE process, makes it necessary to conduct a broad and updated meta-analytical study. The specific aim is to offer a panoramic vision to the scientific and educative communities about how interests and research areas have changed in attitudes toward disability within the educational community over the years, which is feasible through a bibliometric approach that analyses data and metadata from pre-existing specialized articles.

Materials and Methods

Study Design

The present study is framed within the area of retrospective studies (Ato et al., 2013), as it involves the analysis of previous studies. In the same way, it falls within the category of theoretical studies (Montero & León, 2007), as it conducts a literature review based on the premise of bibliometric studies.

Data Extraction

For the search and compilation of documents, the present work used a set of articles as a homogeneous basis for citation, counting the main collection of Web of Science (WoS). This followed prior recommendations (Denche-Zamorano et al., 2023; Hernández-Beltrán, Espada et al., 2023), enabling the extraction of pertinent information for each published study on the topic, including the title, publication year, abstract, and author information, among other details.

Search Strategy

The search strategy was based on a search vector about attitudes towards disability and inclusion in PE teachers, and without restricted time parameters, performing the search and extraction in October 2023. For search and selection of documents the terms "Physical Education",

“Inclusion”, “Attitudes” and “Teachers” were used as key word, using the “topic” filter to identify those documents that includes these keywords in the title, abstract, or keywords. Besides, the selected documents had to meet a series of inclusion and exclusion criteria (Table 1).

Table 1.

Document inclusion and exclusion criteria.

Nº	Inclusion criteria
1	Mention at least some of the characteristics about attitudes towards disability and inclusion in Physical Education teachers in Elementary and Primary Education and/or Secondary Education Level.
2	Scientific articles.
3	Full text or abstract available.
Exclusion criteria	
4	Documents in which only the keywords entered in the databases are mentioned.
5	Documents that cannot be referenced.
6	Manuscripts that only refer to Inclusive Education in general.

Source: Own elaboration.

The document search was conducted by two researchers in October 2023, and any disagreements during the search process and the identification of relevant papers were resolved through discussions with a third author. The literature search was conducted from the inception of the database (1992) to 30 September 2023, with no restrictions on the search strategy regarding year or language.

The sample considered articles from scientific journals. A total of 181 documents were found in the first search phase. Articles that appeared potentially relevant due to their titles were further reviewed. After carefully reading each abstract, only 161 documents that meet the established inclusion criteria were selected. Abstracts from conferences, books, book chapters, and documents with early access on WoS were excluded. Therefore, only original and review articles were included in this analysis. Figure 1 shows the details of the search and study selection methodology

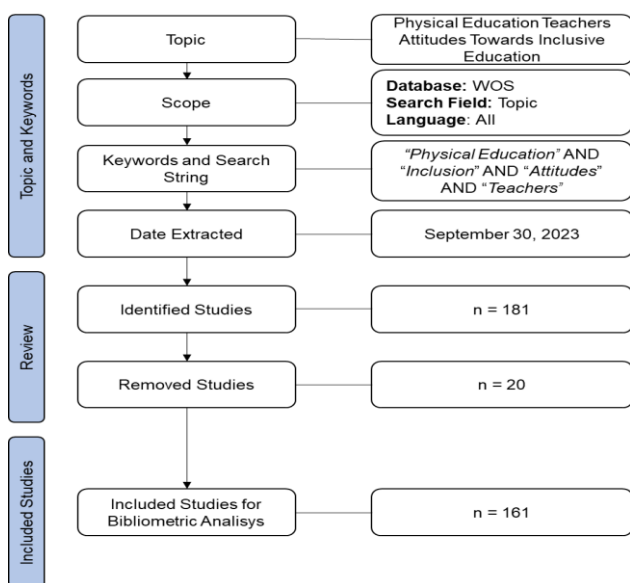


Figure 1. Temporary trend of publications on attitudes towards disability and inclusion in physical education teachers.

Data Analysis

The resultant set of articles was analysed bibliometrically, a meta-analytic method previously used in the sport science area for analysing general bibliometric, scientific production, science mapping, and scientific trends in terms of their exponential growth, to guarantee a critical mass of documented scientific production that ensures interest in the international scientific community and gives meaning to the subsequent analysis (Araya-Castillo et al., 2022; Marín-Suelves & Ramón-Llin, 2021), establishing the time median and its contemporary and obsolete periods.

For the statistical analysis, the Bradford’s law of concentrations was applied to the academic journals, fragmented into thirds of articles, avoiding the exponential decreasing performance by expanding the search of references in peripheral scientific journals to the topic under study (Urbizagástegui Alvarado, 1996). To recognize the most prolific group of authors and study themes, the Lotka’s law about authors was applied in isolation from the other authors with a smaller number of publications, based on the irregularly distributed scientific production among authors (Lotka, 1926). The h-index was used for articles, based on the most cited by the scientific community, and the citations they have received in other publications of the analysed databases, established as the “n” documents cited “n” times or more (Crespo & Simoes, 2019; Ming et al., 2009). To determine through empirical observation the words with the highest frequency of occurrence in the set of articles studied, the Zipf’s law on words was applied (author keywords, keywords plus, or key terms on titles or abstract) (Kingsley Zipf, 1932).

The visualization of spatiality, and the information processing, co-authorship, and co-occurrence (Frenken et al., 2009; Moravcsik, 1985), were managed with VOSviewer Software, using fragmentation analysis with thematic and time trend visualization outputs (Bondanini et al., 2020; Uribe-Toril et al., 2019).

Results

Evolution in the Number of Publications

The resultant search comprised 161 articles published between 1995 and 2023 (Table 2). However, only between 2012 and 2023 is there a continuity of publications, and it is possible to check the adjustment to exponential growth (in this case 68%), with a total of 139 articles published between 2012 and 2023 (See Figure 1).

Additionally, by splitting the number of articles with the median into two halves, the latest half of papers are the contemporary articles (2019–2023) and the other older half, the obsolete articles (1995–2018). It can be observed that the year with the highest number of publications was 2022 ($n = 22$).

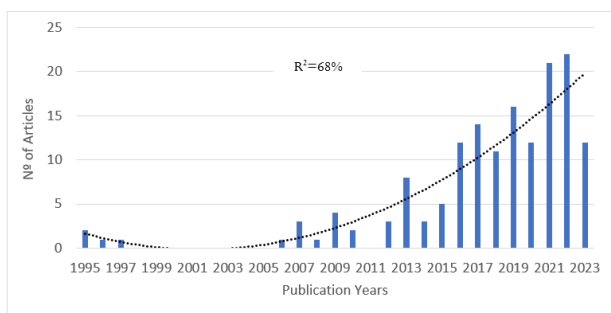


Figure 2. Temporary trend of publications on attitudes towards disability and inclusion in physical education teachers.

Web of Science Categories

Table 2 shows the results for the WoS categories with at least 2 articles published, including the number of documents included in each category, as well as the percentage of the total number of documents. The “Education Educational Research” ($n = 72$) is the WoS category with the largest number of studies published, followed by the “Sport Sciences” category ($n = 39$). Furthermore, it is important to highlight that the number of documents per WoS category exceeds the total number of documents included in this bibliometric review because a single document can be included in more than one category simultaneously.

Table 2. Documents classified regarding the WoS categories.

WoS Categories	Nº of Documents	%	WoS Categories	Nº of Documents	%
Education Educational Research	72	44,72	Green Sustainables Science Technology	5	3,11
Sport Sciences	39	24,22	Social Sciences Interdisciplinary	5	3,11
Rehabilitation	28	17,39	Pediatrics	4	2,48
Hospitality Leisure Sport Tourism	26	16,15	Psychology Experimental	3	1,86
Education Special	14	8,70	Public Environmental Occupational Health	3	1,86
Environmental sciences	7	4,35	Medicine General Internal	2	1,24
Psychology Multidisciplinary	6	3,73	Psichology Applied	2	1,24

Publications trends

When attempting to establish the Bradford zones by selecting journals and the number of articles published in each journal, it can be observed that there are different levels of publication that serve as criteria for dividing the set of journals into thirds. In this case, an elitist criterion is used, and it is evident that there is a core of 17 journals that contain 59,6% of the articles, followed by 12 journals that have published two articles on this topic, and another 41 journals that have only published one article. Therefore, we have a weak core and a high level of peripheral dispersion. Furthermore, when reviewing the temporal aspects of these publications, particularly for the primary journals over time periods, it can be seen how the number of articles in the Bradford core journals has multiplied in the last ten years (Table 3). The Table 3 also shows the Journal Citation Report (JCR) quartile of each journal.

In terms of citations (metadata: Times Cited, WoS Core), we obtain an h-index, also known as the Hirsch index, with a value of 29. This indicates that there are 29 articles cited 29 times or more, with citation counts ranging from 30 to 214. From this analysis, we can identify 132 low-impact articles, many of which have no citations or only one citation. However, within this set of 29 articles, there are notable differences in scientific evaluation expressed through citations. Figure 3 illustrates two articles with atypical citation counts ($n = 214$; $n = 136$), and eight articles that are in the upper quartile, with citation counts ranging from 63 to 214. These findings highlight that these articles are highly regarded by the scientific community, surpassing the mean of 57 and the median of 48 citations per article.

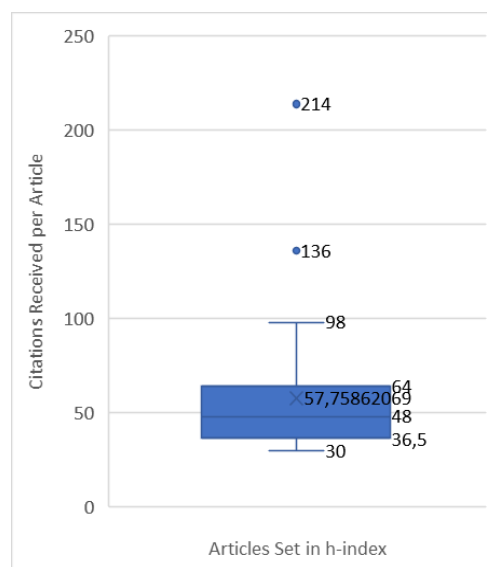


Figure 3. Box plot of citations received per article on attitudes towards disability in physical education.

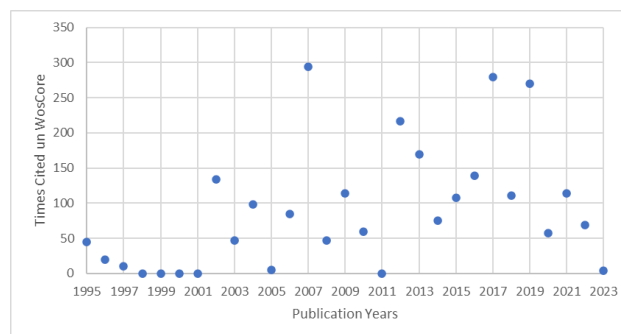


Figure 4. Citations received per article on attitudes towards disability in physical education teachers by publication year.

Figure 4 represents the total times cited in WosCore in terms of year of publication. *Most Cited Documents*. Table 4 shows the top 10 documents with the highest number of citations, along with their respective authors and the number of citations received per year since their publication. The data indicates that the article by Hutzler et al. (2019), is the

most cited per year (21,66) since its publication in 2019, accumulating a total of 65 citations. This underscores its current significance as the most relevant article in the field of study related to attitudes toward disability among physical education teachers."

Table 3. Publications trends on attitudes towards disability and inclusion in physical education teachers, between 1995 and 2023.

Journals	JCR Category	JCR Impact Factor	1995-2018	2019-2023	Total	%
Adapted Physical Activity Quarterly	Rehabilitation/ Sport Sciences	Q3	12	3	15	9,3
Retos-Nuevas Tendencias en Educación Física Deporte y Recreación	Hospitality, Leisure, Sport & Tourism	-	2	11	13	8,1
European Physical Education Review	Education & Educational Research	Q2	4	4	8	5,0
German Journal of Exercise and Sport Research	Sport Sciences	-	3	4	7	4,3
International Journal of Disability Development Education	Special Education/ Rehabilitation	Q4	5	2	7	4,3
Physical Education and Sport Pedagogy	Education & Educational Research	Q1	4	3	7	4,3
Sport Education and Society	Education & Educational Research/ Sport Sciences	Q2	3	2	5	3,1
Sustainability	Environmental Sciences / Environmental studies	Q2	0	5	5	3,1
Frontiers in Psychology	Psychology, Multidisciplinary	Q1	0	4	4	2,5
Journal of Teaching in Physical Education	Education & Educational Research/ Sport Sciences	Q2	3	1	4	2,5
Children-Basel	Pediatrics	Q2	0	3	3	1,9
European Journal of Special Needs Education	Special Education	Q1	0	3	3	1,9
Frontiers in Education	Education & Educational Research	-	0	3	3	1,9
Movimento	Education & Educational Research/ Social Sciences, Interdisciplinary	Q4	3	0	3	1,9
Palaestra	Education & Educational Research	-	2	1	3	1,9
Perceptual and Motor Skills	Psychology, Experimental	Q4	3	0	3	1,9
VIREF - Revista de Educación Física	Education & Educational Research	-	1	2	3	1,9
Total			45	51	96	59,6

H-Index

Table 4. Articles with a higher number of citations.

Title	Authors	Publication Year	Journal Abbreviation	Total Citations	Average per Year
Inclusion in physical education: A review of the literature from 1995-2005	Block, ME; Obrusnikova, I	2007	Adapt Phys Act Q	214	14,26
Inclusion in Physical Education: A review of literature	Qi, J; Ha, AS	2012	Int J Disabil Dev Ed	136	13,6
High school general physical education teachers' behaviours and beliefs associated with inclusion	Hodge, SR; Ammah, JOA; Casebolt, K; Lamaster, K; O'Sullivan, M	2004	Sport Educ Soc	98	5,44
Comparison of practicum types in changing preservice teachers' attitudes and perceived competence	Hodge, SR; Davis, R; Woodard, R; Sherrill, C	2002	Adapt Phys Act Q	89	4,45
Inclusion of Children with Disabilities in Physical Education: A Systematic Review of Literature From 2009 to 2015	Wilhelmsen, T; Sorensen, M	2017	Adapt Phys Act Q	69	13,8
Attitudes and self-efficacy of physical education teachers toward inclusion of children with disabilities: a narrative review of international literature	Hutzler, Y; Meier, S; Reuker, S; Zitomer, M	2019	Phys Educ Sport Ped	65	21,66
Experiences of Individuals with Visual Impairments in Integrated Physical Education: A Retrospective Study	Haegle, JA; Zhu, XH	2017	Res Q Exercise Sport	65	13
Forty years later, a systematic literature review on inclusion in physical education (1975-2015): A teacher perspective	Tant, M; Watelain, E	2016	Educ Res Rev-Neth	63	10,5
A Diversity of Voices: Physical education teachers' beliefs about inclusion and teaching students with disabilities	Hodge, S; Ammah, JOA; Casebolt, KM; LaMaster, K; Hersman, B; Samalot-Rivera, A; Sato, T	2009	Int J Disabil Dev Ed	56	4,30
Including high school students with severe disabilities in general education classes: Perspectives of general and special educators, paraprofessionals, and administrators	Carter, EW; Hughes, C	2006	Res Pract Pers Sev D	55	3,43

Authors and Co-Authors of the Documents

These 161 articles are the result of the scientific production of 422 authors, so it is estimated that the number of articles of the most prolific authors is 20 (Root Square (423) \approx 20). However, in empirical terms, there are 52 authors with two articles and 19 authors with three articles. When exploring with VOSviewer for the total of 422 authors, not all of them relate to others. The graph of 22 clusters shown in Figure 5, considering authors with at least 2 articles, was obtained by means of a normalization analysis with the fractionation method (attraction: 2; repulsion: -1).

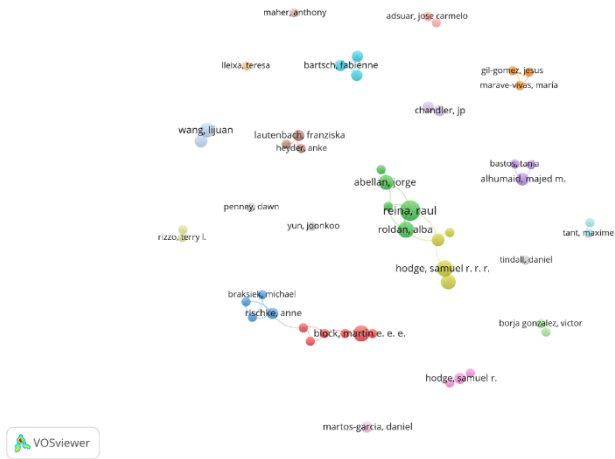


Figure 5. Co-authors graph on attitudes towards disability in physical education.

The fragmentation level is accentuated at the organizational level. As depicted in Figure 6, there are 49 organizations with a minimum of two articles, totalling 226 organizations (while 177 organizations have made only one contribution to the field of attitudes towards disability in physical education). This further reinforces the identification of an actor's configuration, which is based on competitive interaction or structural equivalence (Burt, 1987; Huang et al., 2011). The graph of 19 clusters shown in Figure 6, considering authors with at least 2 articles, was obtained by means of a normalization analysis with the fractionation method (attraction: 2; repulsion: -1).

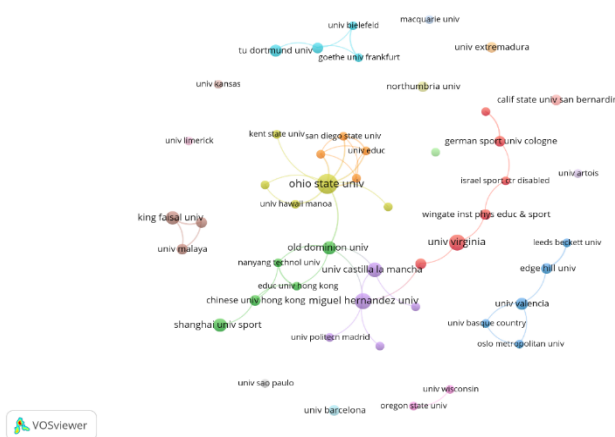


Figure 6. Organizational co-authors graph on attitudes towards disability in physical education.

Finally, in terms of co-authorship at the country or region level, the USA stands out from the rest of the countries (47 countries), as a hegemony in the production of knowledge on attitudes towards disability in physical education, with 44 contributions per author affiliation, followed by Spain with a total of 35 publications (Figure 7). The graph of 15 clusters shown in Figure 7, was obtained by means of a normalization analysis with the fractionation method (attraction: 3; repulsion: -3).

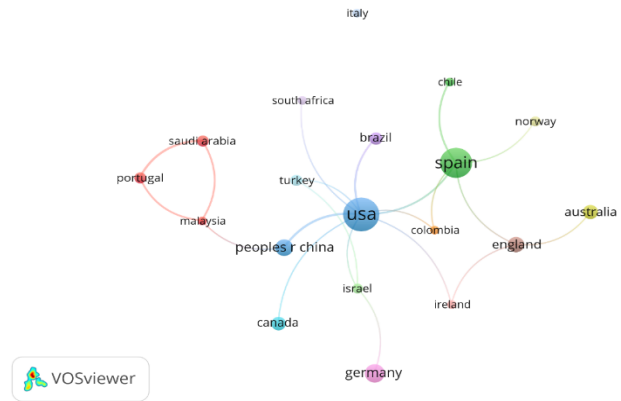


Figure 7. Country co-authors graph on attitudes towards disability in physical education.

Lastly, according to Zipf's Law, five thematic clusters are identified, that evince semantic differences, as represented in Figure 8. Those are focused on attitudes towards students with disability, associated with training or program about self-efficacy in teaching about diversity.

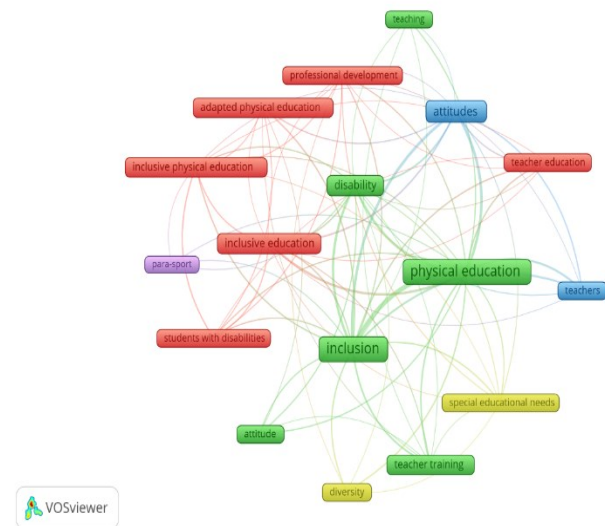


Figure 8. Thematic author keywords graph.

A more interesting result is represented in Figures 9–10, on the temporal evolution of keywords and key terms.

It shows an alternative trend to understanding the evolution and role of attitudes toward disability in physical education. Thus, Figure 9 represents the temporal evolution of the 17 outstanding author keywords with five or more occurrences, out of a total of 301 author keywords, showing the topics of *Adapted Physical Education*, and *attitudes* the oldest

published on average and *teacher training*, *inclusive education*, and *para-sport* being the most recent.

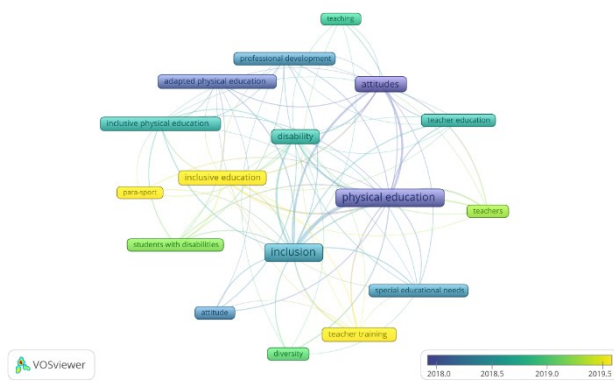


Figure 9. Temporary author keywords graph.

Finally, the text data map for the key terms in Figure 10 results in 3436 terms extracted with VOSviewer (Root Square (3436) \approx 58), analyzing 49 key terms with 15 or more occurrences. This reinforces the temporal evolutions of the themes represented in the previous graphs.

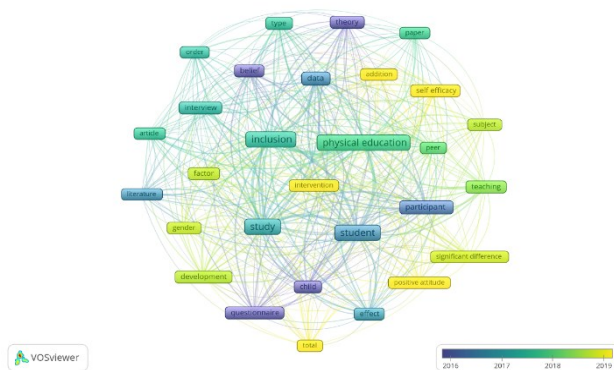


Figure 10. Temporary Key Terms Graph.

Discussion

This research paper aims to conduct a bibliometric review of attitudes towards disability and inclusion among PE teachers. This objective has been motivated to understand current research trends, serving as a basis for future literature reviews or research works that are current and aligned with the interests of the scientific and educational community. This study offers several advantages, including coverage of various journals and the calculation of Bradford zones, distinguishing it from other bibliometric analyses related to inclusion in PE (Marín-Suelves & Ramón-Llin, 2021). The present document used a set of articles as a homogeneous basis for citation, counting the main collection of the WoS. The resultant search comprised 161 articles published between 1995 and 2023. When attempting to establish the Bradford zones by selecting journals and considering the number of articles published in each journal, it becomes apparent that there exist varying levels of

publication. This diversity serves as a crucial criterion for dividing the set of journals into thirds, culminating in the identification of a core of 17 journals that contain 59,6% of the articles. Consequently, we find a core that is relatively weak and a substantial dispersion in peripheral journals (Marín-Suelves & Ramón-Llin, 2021; González-Zamar & Abad-Segura, 2020). Moreover, when delving into the temporal aspects of these publications across different time periods, it becomes evident that the number of articles within the Bradford core journals has undergone a significant increase over the past decade. This trend aligns with observations made in other reviews on the same subject matter. Furthermore, attending the JCR impact factor only three Journals are in quartile 1 with the biggest impact factor, *Physical Education and Sport Pedagogy*, *Frontiers in Psychology*, and *European Journal of Special Needs Education*, and five journals in quartile 2. These data should be taken into account by future researchers to understand and decide in which journals they can submit their scientific work related to attitudes towards disability in PE teachers. The identification of core journals and prolific authors in the field provides valuable guidance for researchers seeking to disseminate their work effectively. Future researchers can utilize this information to determine where to submit their scientific contributions and establish academic networks for collaboration and knowledge exchange.

Regarding the WOS categories, this review underlines that “Education Educational Research” is the category with the highest number of studies ($n = 72$), and considering the journal, “Adapted Physical Activity Quarterly” is at the top with 15 studies. As a result of the application of the H-index, we observed that 29 of the selected studies have 29 or more citations. Only two of the selected documents show more than 130 citations (Block & Obrusnikova, 2007; Qi & Ha, 2012), with 214 and 136, respectively. It shows the interest of the scientific community in those studies because they both analyze the importance of inclusion in PE through a systematic review of the literature (Block & Obrusnikova, 2007; Qi & Ha, 2012). Identifying future lines of research will provide the scientific community, educational community, and parents with important information related to attitudes towards disability in the IE.

The total of 161 articles are the result of the scientific production of 422 authors. However, in empirical terms, there are 52 authors with two articles and 19 authors with three articles. When exploring with VOSviewer for the total of 422 authors, not all of them relate to others. Being Raul Reina ($n = 10$), Alba Roldán ($n = 6$) and Samuel Hodge ($n = 6$), the three authors with more publications on the topic. These data can be useful for the scientific community to identify the most prolific authors in a field, as well as for establishing academic networks with the aim of planning and organizing future research directions. The high level of collaboration observed among institutions and countries underscores the importance of fostering collaboration and networking within the scientific community. Researchers can leverage these collaborative networks to exchange

ideas, share resources, and plan future research directions aimed at advancing inclusive education practices.

From a methodological point of view, this study allows us to identify the principal topics on which the scientific community investigate about inclusion in PE and the teachers' attitudes towards disability. This study also provides greater coverage of the number of articles analyzed than other recent bibliometric studies (Marín-Suelves & Ramón-Llin, 2021). Is important to point the high collaboration between institutions and countries, being EEUU, Spain and Germany the countries with a greater number of publications. Finally, the impact of the articles assessed through the number of citations received was low, which coincides with other bibliometric studies in the social sciences, and sports area (Blanca-Torres et al., 2020; Marín-Suelves & Ramón-Llin, 2021)

The present bibliometric analysis stands out the current trend of the research about inclusion, trough the development of interventions and education programs in attitudes towards disability. Being one of the main ways to improve attitudes towards people with disabilities in the educational field, the specifics training programs, and the promotion of activities in which the participants can experience and learn about disability (Ocete-Calvo et al., 2015; Reina et al., 2016). By understanding current research trends in attitudes towards disability and inclusion among PE teachers, this study serves as a foundation for future literature reviews and research endeavours. Researchers can use these insights to identify gaps in the existing literature and formulate research questions that are relevant and aligned with the interests of the scientific and educational community.

This study provides a general overview of the current research topics related to inclusion in PE. However, there is a low percentage of articles that provide information on the types of training programs for teacher attitudes and their applied methodologies. The identification of research gaps, such as the lack of information on training program methodologies, highlights areas where further investigation is needed. Future research endeavours should focus on addressing these gaps by specifying the methodologies employed in training programs and reporting their outcomes, thereby contributing to the advancement of knowledge in this field. Also, in this context, the public education system should actively support these training activities to promote successful inclusive education. Furthermore, it would be valuable to develop an instrument for assessing inclusion in the PE classroom.

Conclusion

An exponential growth in the study of attitudes towards disability and inclusion in physical education teachers is evident over the last decade, based on the analysis of 161 extracted articles (1995-2023). This indicates a growing interest from the scientific community and identifies a contemporary publication period between 2019 and 2023, which encompasses more or less a half of the articles

published during the study period.

In terms of reference sources, out of a total of 70, there is a core of 17 journals that contain 59,6% of the articles. Additionally, 12 journals have published two articles on this topic, while another 41 journals have only one article.

At the author level, out of 422 authors, only 52 have two or more publications on the topic, revealing a moderate level of fragmentation at the individual and institutional levels, suggesting a potential for collaborative interactions.

Finally, in terms of co-authorship at the national or regional level, the USA stands out among 47 countries as a dominant force in the production of knowledge related to attitudes towards disability in PE, with 44 contributions per author affiliation. Spain follows with a total of 35 publications.

This analysis indicates that the set of articles has evolved from qualitative studies focusing on the inclusion of students with special needs in physical education, to training programs concerning attitudes towards disability and the self-efficacy of teachers as specific topics in recent years.

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Datos de los autores y traductora:

Luisa Gámez-Calvo	lgamezna@alumnos.unex.es	Autor/a – Traductor/a
José M. Gamonales	josemartingamonales@gmail.com	Autor/a
Víctor Hernández-Beltrán	vhernandpw@alumnos.unex.es	Autor/a
Jesús Muñoz-Jiménez	suliwan@unex.es	Autor/a