

Meta-Analysis of Physical Education Didactics

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Abstract

This article aims to analyze the current state of physical education teaching from bibliometrics. In the methodology, the meta-analysis started from a sample of 316 documents in Scopus that revealed 85 keywords related to physical education teaching, highlighting two fundamental categories, physical education and Education. The analysis concludes that physical education teaching is constantly evolving, with a focus on teacher training, inclusion and formative assessment, which is crucial to improve educational quality and the comprehensive well-being of students. Among the main results, a historical evolution was observed since 1978, with a boom in scientific production from 2006 onwards. The stages include the integration of physical education into healthy habits (1978-1989), diversification of activities (1990-1999), constructivist approaches (2000-2009), adaptation for students with diverse abilities (2010-2019) and a focus on comprehensive well-being post-pandemic (2020-present). Countries that are leaders in didactics were identified, with an emphasis on North America, Europe and Asia, while regions such as Africa show a lack of interest. The most prominent institutions include the University of Salerno and Harvard. The leading journals in this field are Retos and Staps. Authors such as Raiola and Amade-Escot are fundamental in scientific production.

Keywords: Bibliometric analysis, didactics, physical education, didactics of physical education.

1. Introduction

Physical education bases its teaching-learning processes on body movement in the environment (Lucena et al., 2020). It constitutes the training of physical education and sport teachers to face the constant change in education to carry out effective learning (Alfonzo et al., 2024). It is the point of balance where science and technology meet experience to create the foundations on which success is built (Guillén et al., 2023).

The average levels of physical activity in children are below the ideal, which can influence children's health and motor competence levels (Kurnaz et al., 2024). Physical education, sport and recreation is a discipline that has always generated great utility in society in general, from

different generations (Sanabria et al., 2023). The approach to personal experiences and previous ideas about physical education of future primary education teachers is a starting point of great interest for teaching the subject of physical education didactics (Eirín-Nemiña et al., 2024). In addition, there is a need to generate physical activity literacy (Carolo et al., 2023).

Concern for values education is a current issue and is considered very important in the initial training of future teachers (Soto González et al., 2021). Physical education represents a good strategy to contribute to maintaining daily physical activity levels (Burgueño et al., 2021). It is important to consider teaching practices and learning approaches in relation to the curricular sustainability of physical education (Lorente-Echeverría et al., 2023). Quality indicators are statements that explicitly define the properties or characteristics of a given construct or phenomenon and can act as a benchmark for improvement in physical education classes (Leão & Lorente-Catalán, 2024).

Comparing educational intervention studies on the effects of combining physical education in the classroom and its physical effects, cognitive and academic performance (Cámara et al., 2023), help from postural education to acquire especially important benefits in the early levels of school education (Agudo et al., 2024). Evaluation is related to how teachers approach and understand physical education. Assessing teachers' perceptions of assessment at different stages of physical education is essential (Hortigüela-Alcalá et al., 2021). Knowing the emotional experience of students during physical education classes has gained great relevance after the publication of the new educational curricula (Founaud_Cabeza et al., 2023).

A social and moral development of adolescents is obtained by studying the objective levels of physical activity during physical education classes in adolescents (Guijarro-Romero et al., 2020). Physical activity and sport provide an environment conducive to the promotion of personal and social values in adolescents (Vega-Ramírez et al., 2021). Board games are an instrument to improve physical fitness in students, creating a playful and motivating educational environment (Prieto, 2024). Body percussion has been used to develop skills related to body expression, due to its socioemotional benefits for the people who practice it (Garcías de Ves et al., 2022).

Offering motor experiences at the primary level that contribute to the development of basic motor skills through the implementation of the play-domotor and game-based teaching strategy (Pérez et al., 2022), guarantees collaborative learning. For them, it is necessary the implementation of an educational methodology established in the interaction of small working groups, in which students internalize the learning of all types of content (Bermejo et al., 2021).

Within the didactics of physical education there are related perceptual-motor variables such as temporal structuring, attitude, spatial structuring, postural control, coordination and balance (Romero et al., 2023). The above warrants being aware of the perception of physical education teachers about the relationship between collaborative learning and emotional intelligence (Sánchez et al., 2021; Palomares et al., 2024).

Combine Physical Education classes with unstructured practice during breaks to increase students' decision making and performance (Práxedes et al., 2021). It provides a multicomponent exercise package on psychoemotional variables, quality of life and functional capacity (Chacón et al., 2024). One of the aims of physical education is the promotion of physical activity through

equal opportunities between boys and girls, accepting diversity (Moya-Mata et al., 2023). As well as, analyzing the relationships between the level of physical fitness and perceived parental support in overweight and obese adolescents (López-Serrano et al., 2020). It also empowers physical education as one of the primary foundations of life, for physical, mental and social health (Zurita-Ortega et al., 2018).

However, a discontinuous didactic unit of physical preparation through motor coordination only improves the levels of cardiorespiratory capacity (Guijarro-Romero et al., 2020). The assessment of motor coordination at an early age is one of the demands of the Physical Education professional and researchers in this field (Cenizo et al., 2017).

Therefore, identifying the key aspects that should be considered to provide resilient experiences in physical education classes, in order to improve their educational and inclusive value (Mundet et al., 2024). There are numerous studies that address the problem of bullying, but few that seek a solution within the area of physical education (Fernández et al., 2024). According to these studies, physical education with appropriate didactics can reduce bullying, which is increasingly present in schools, predominantly among students between 10 and 14 years of age. However, there is evidence that physical activity levels in adolescents during physical education classes are below the recommended levels, especially in overweight students (Royo et al., 2024).

The theories of multiple intelligences are applicable to physical education classes as a formative experience with elementary school students (Aguilera, 2022). This means that teachers must reconstruct themselves and adapt to unprecedented situations (Hortigüela-Alcalá et al., 2021).

A teacher's experiences and performance in physical education classes are of vital importance for the achievement of significant results (Askildsen & Løndal, 2024). Examining the current state of the scientific literature and identifying the thematic trends in published studies on physical education teacher educators in Latin America are of vital importance for the development of this pedagogical area (Aguilar-Valdés et al., 2024).

Within physical education, the games block reaches hierarchy in educational approaches, with team sports being the most used (Lira et al., 2024). Pedagogical approaches for health-related physical education in the context of digitization are also inserted in this context (Teutemacher et al., 2024). The criteria for activating physical education, its theoretical positioning and empirical foundation from the teachers' perspective (Stabick et al., 2023). Ensures teacher training in physical education through the creation of a repository of didactic units (Rius et al., 2023).

Once the theoretical analysis of the research has been established and the main theories and lines of research have been studied, the research question is defined: What is the current state of the didactics of physical education from the meta-analysis? The general objective has been to analyze the current state of the didactics of physical education from the meta-analysis.

2. Methodology

The methodology used in the meta-analysis analysis is based on the examination of 316 scientific papers from the Scopus database, where the co-occurrence method was applied to identify 85

relevant keywords. This procedure was performed with VosViewer and Bibliometrix software. Regarding the research paradigm, it can be inferred that quantitative approach is used, since it is adjusted with the collection and analysis of numerical data (such as the number of publications and keywords) to establish patterns and trends in the didactics of physical education. The positivist paradigm was also used. This paradigm is characterized by the search for quantifiable data and the application of statistical methods to analyze phenomena, in this case bibliographic phenomena, by identifying patterns in scientific production, reflecting a perspective that seeks objectivity and veracity in the results, typical of positivism.

Procedure

The study of the didactics of physical education is fundamental to understand how teaching and learning take place in this specific field. As research in this field has evolved, it has become crucial to establish a methodological framework that allows for a systematic analysis of significant trends, categories and contributions. The procedure applied (Figure 1) is structured in six stages ranging from the identification of conceptual categories to the analysis of relevant authors and scientific journals.

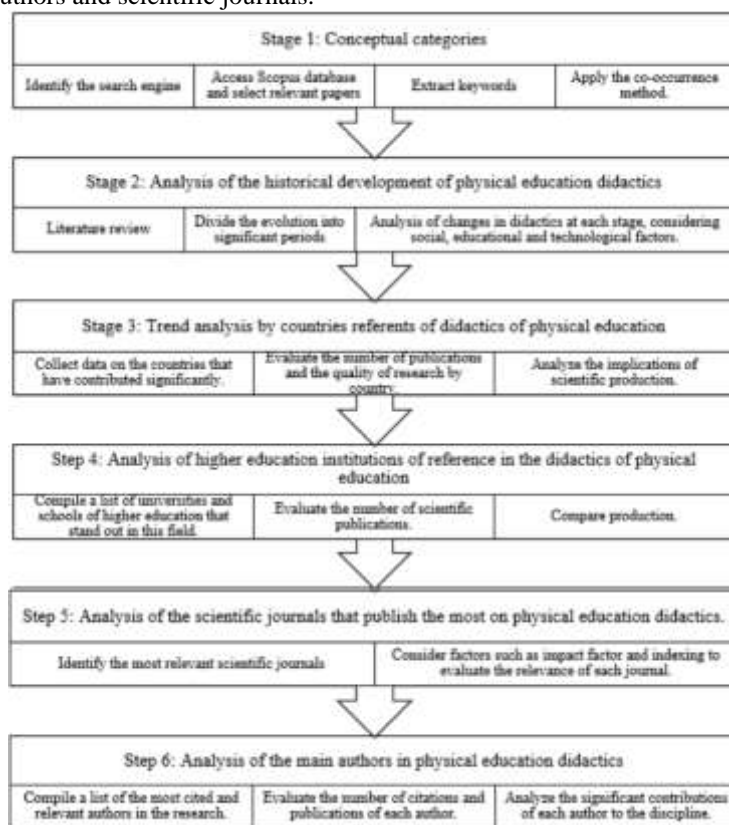


Figure 1. Procedure

Population and sample

Based on the above, for this first stage, 316 scientific documents were analyzed from the Scopus database related to physical education didactics. Of these, 1,764 keywords were established, where through the co-occurrence method, 85 keywords were established by removing those that are repeated continuously.

3. Results

Stage 1. Conceptual categories

In addition to the theoretical analysis, conceptual categories were established that are related to the object of study and that from a meta-analysis it is possible to visualize the current panorama of scientific research related to the didactics of physical education. This procedure is carried out with the VosViewer meta-analysis software where, with a 95% effectiveness and a 5% error rate, it enhances the veracity of the categories found (Figure 2).

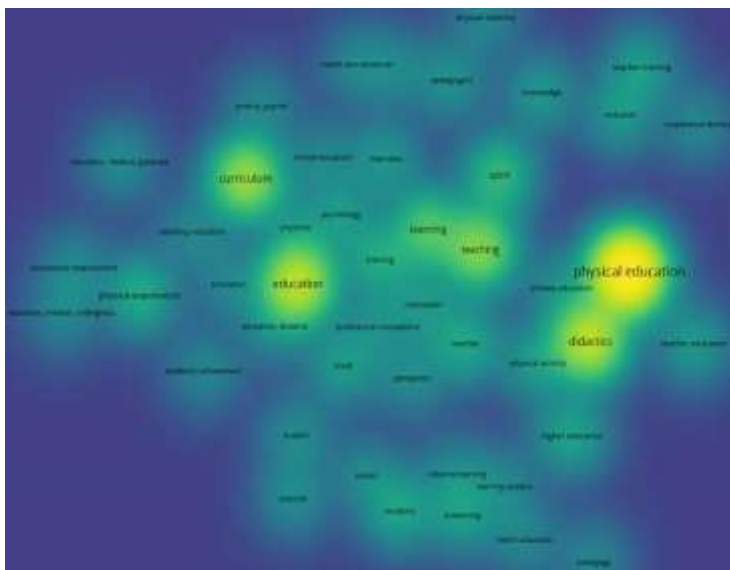


Figure 2. Breakdown of key terms. Source. VosViewer 2024 meta-analysis software.

Figure 2 shows two (2) fundamental categories: physical education and didactics. Based on the above, the main terms of the categories are broken down, of which the scientific documents group physical education with didactics as defined in the title of the research coincidentally and education with the curriculum as guiding elements of the area under study, which in this case is physical education within educational institutions: Physical education: Didactics, comparative

didactics, pedagogy, teacher training, inclusion, learning, comparative learning, learning system and distance learning (Figure 3).

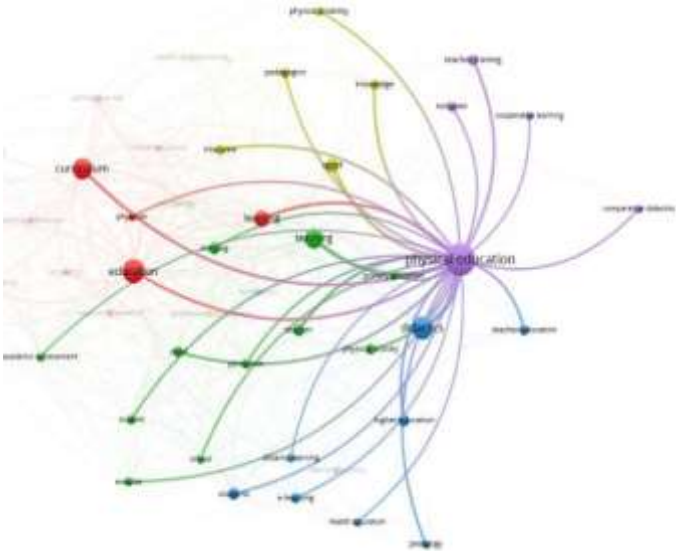


Figure 3. Breakdown of terms related to the physical education category. Source: VosViewer 2024 meta-analysis software.

Education: Distance education, simulation, curriculum, physical exercise and physical examination (Figure 4).

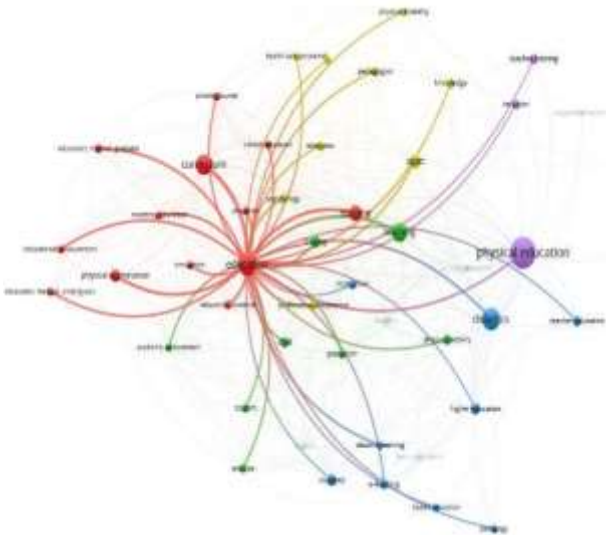
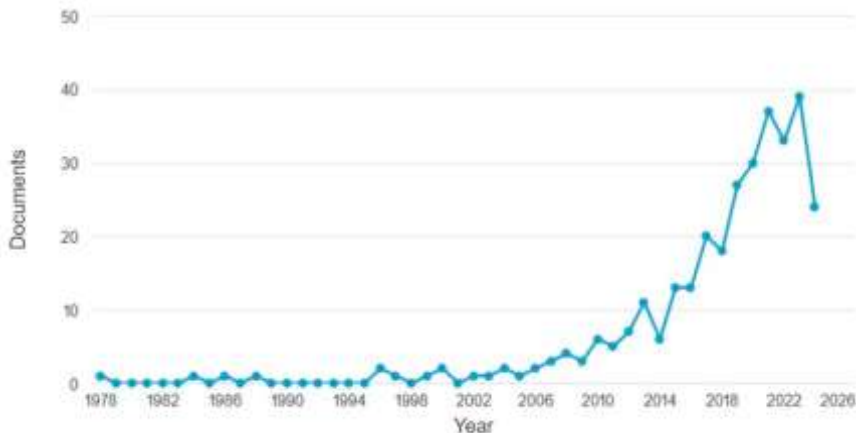


Figure 4. Breakdown of terms in the Education categories. Source: VosViewer 2024 meta-analysis software.

Stage 2. Analysis of the historical evolution of physical education didactics.

Once the conceptual categories have been established, they establish a traceability of the research from its beginnings, as well as the importance of the topic to see its evolution, which will be developed in stages (Figure 1). In general terms, although the importance of the didactics of physical education has its scientific beginnings since 1978, its peak of scientific production starts from 2006 to the present, highlighting the importance and novelty of the topic, as well as the generation of research lines by researchers.



Graph 1. Historical evolution of physical education didactics.

Source: Scopus 2024.

In the meta-analysis of publications by year, it was possible to identify that research on physical education didactics from 1978 to 1994 was very low, being mainly directed towards health issues. From 1995 onwards, with the creation of physical education programs at a global level, didactics in this discipline stands out for the transformation of activities, incorporating new sports and recreational activities, promoting inclusion and diversity. In the following decade from 2000 to 2010, didactics adopted a constructivist approach with pedagogical methodologies focused on the student, active learning and class participation, incorporating the methodology in physical education classes through multimedia resources and digital platforms.

In the 2010-2019 period, emphasis is placed on adapting activities for students with different abilities and needs. The development of socioemotional competencies is promoted through physical education, fostering values such as teamwork and respect. From 2020 to the present, the didactics of physical education is adjusted in the integral wellbeing of the student, including physical, emotional and social aspects, especially in response to the challenges of the pandemic. Prioritizing the continuous training of teachers and innovation in methodologies, adapting to social and technological changes.

Stage 3. Analysis of trends by countries in physical education didactics

When we talk about the didactics of physical education, we mention the reference countries of the subject under study, since they provide academic and scientific experience that should be studied to generate new knowledge or implement new practices (Graph 2).



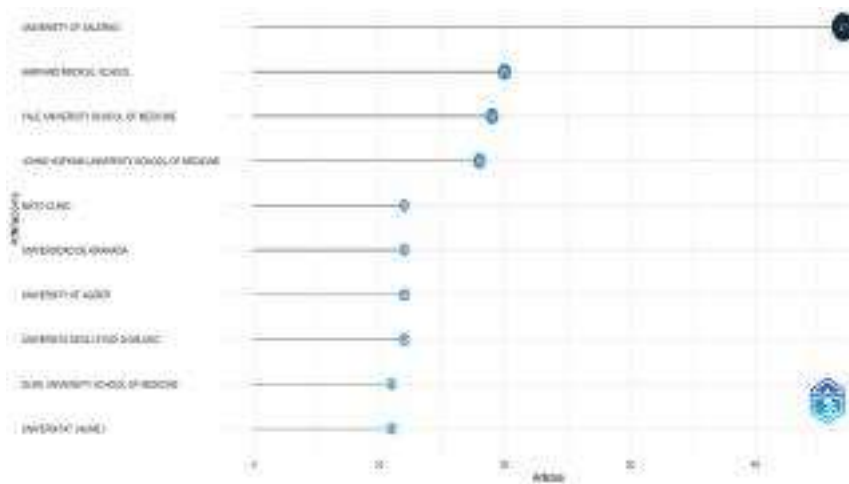
Graph 2. Reference countries in physical education didactics

Source: Bibliometrix 2024 software.

Graph 2 shows the strong influence of countries in North America, Europe, Asia, Oceania and Latin America. However, there is evidence of a lack of concern on the part of other countries such as Africa, Eastern Europe, Persian Gulf countries and many Latin American countries. This research has shown the importance of this topic in the development of childhood and adolescence, specifically in the development of skills and abilities that go beyond the barrier of only motor skills; however, it is evident that more work needs to be done in this area of vital importance for the development of humanity.

Stage 4. Analysis of higher education institutions of reference in the didactics of physical education.

The importance of this indicator is based on the need for knowledge for exchange, study, project development, research, exchange of experiences, benchmarking studies, student and professional development, and the development of all those interested in the world of physical education didactics as a form of social development (Graph 3).



Graph 3. Higher education institutions of reference in the didactics of physical education.

Source: Bibliometrix 2024 software.

Among the main institutions of higher education in physical education didactics, we have the University of Salerno with 47 scientific publications, followed by Harvard Medical School with 20 publications, Yale Medical School with 19, Johns Hopkins School of Medicine with 18, Mayo Clinic, University of Granada, University of Granada, University of AGDER and University of Milan with 12 publications, among other institutions.

Stage 5. Analysis of the scientific journals that publish the most on physical education didactics.

Among the journals that publish the most on physical education didactics are the following: Retos, Steps, Journal of human sport and exercise and physical education and sports pedagogy (Graph 4). This highlights how a Hispanic journal leads this topic worldwide.

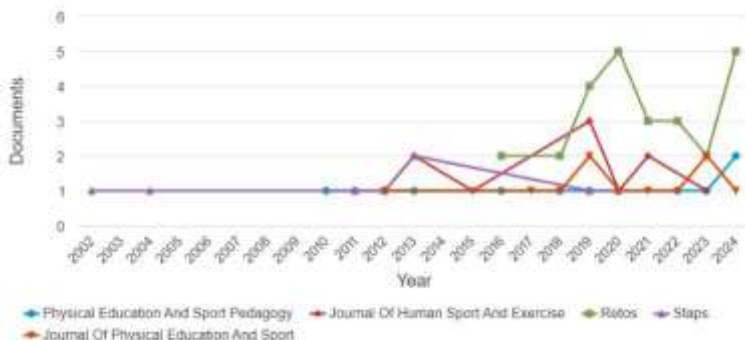


Figure 4. Scientific journals that publish the most on physical education didactics.

Source: Scopus 2024.

Stage 6. Analysis of the main authors with respect to the didactics of physical education.

The authorship of the articles can lead to an insight into the perspective from which they were analyzed and created. Each author provides the article with a critical analysis on the theoretical foundations of didactics, physical education or its set that allow understanding the principles and methods of teaching in this field. Among the authors who stand out the most with their publications we have Raiola with 14 published articles, followed by Amade-Escot (7), Di Tore and Verscheure (4) and Carlomagno, Colella, D Elia, D Isanto, Fischetti and Giese (3). As an additional element of these authors, we can refer that according to the Scopus database in 2024, they produce scientific information through scientific articles in 84%, 6% through scientific events, 2.5% in book chapters, 5% in reviews among other forms.

Likewise, 32% of these topics are approached from the social sciences, 24% from medicine, and 22% from the professions of physical education, physical activity, sport and recreation, which shows that there is a multidisciplinary interest in the didactics of physical education (Figure 5).

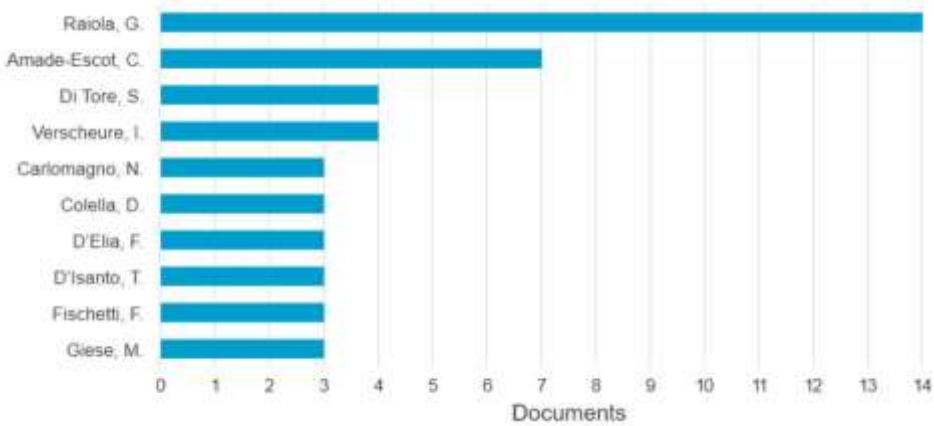


Figure 5. Main authors with publications in physical education didactics

Source: Scopus 2024.

4. Discussion

Since its origins as a social phenomenon, sport has required the organization of each of its activities. In this sense, questions began to arise as to how certain variables and relationships with the environment could transform the way it was administered. There is also a correlation with the experiences of physical education students in teacher training, formative and shared evaluation (Atienza et al., 2023). This is why the importance of the introduction to didactics in sport education, both for students and sport professionals, lies in better understanding how the sporting world is managed from the academy.

Sport education is a complex discipline that requires skills in areas such as marketing, financial management, leadership, team and talent management. Developing more effective forms of pedagogical content knowledge requires physical education teachers-in-training to analyze teaching and learning tasks in contextualized situations (Musard et al., 2024).

Becoming a physical education teacher is a meaning-making process in training in terms of the transition between a subject didactics course and practicum (Westerlund, 2023). Another alternative with holistic perspectives is health disciplines in the curriculum and implications for physical education teaching (Wiklander et al., 2023).

The use of modern multimedia resources in the practice of sport and physical education (Vako et al., 2023). It is a proposal for discussion on what criteria can be used for a diversity-sensitive reformulation of basic assumptions in sport pedagogy that promotes the recognition of performance diversity in the context of inclusive physical education (Giese & Hoffmann, 2023).

The study by Aguilar-Valdés et al. (2024) on physical education educators in Latin America underscores the need for solid and updated training, which not only contemplates theoretical aspects, but also practical ones. This approach establishes the importance of teaching quality, intrinsically linked to the professional preparation of educators, suggesting that comprehensive training has a positive impact on learning if it includes effective pedagogical practices and the incorporation of new technologies.

The work of Agudo Villarejo et al. (2024) integrates alternative approaches in physical education to improve the physical and mental well-being of students. The implementation of this type of program fosters body awareness and makes students receptive to new experiences and socioemotional skills, which are essential for the integral development of the individual. In another study, Marín et al. (2024), highlight that the methodology used for didactics is essential and appropriate for their contexts, thus promoting a more personalized and effective teaching.

According to Askildsen and Løndal (2024), there is a relationship between practice and continuous professional development. Teachers who engage in practice and share their experiences tend to improve their teaching methods and better adapt to the needs of their students. This leads to formative evaluation, which as discussed in the work of Atienza et al. (2023), is another key aspect to consider in the learning process. This implies that teachers should positively influence students' motivation and engagement through assessment tools that promote self-assessment and constructive feedback. This could lead to a biopsychosocial approach to planning inclusive learning environments in physical education (Minghelli et al., 2023).

The implementation of methodologies such as cooperative learning, discussed by Sánchez Molina et al. (2021), promotes an environment of collaboration and emotional development among students. This approach fosters social and emotional skills, through the integral development of students, in conjunction with interaction and teamwork.

According to Cámara et al. (2023), the inclusion of physical activity in the classroom highlights the physical and cognitive benefits that this practice can bring. Regular physical activity has positive effects on their academic performance and emotional well-being, which requires integrating physical activity into all areas of the curriculum. Another term for inclusion can be

physical, intellectual and motor. Giese and Hoffmann (2023) identify the term inclusive physical education, suggesting that it is critical to adopt pedagogical approaches that promote equity and inclusion for all students regardless of their abilities by creating inclusive learning environments.

Chacón Sevilla et al. (2024) show that multicomponent exercise programs can improve psychoemotional variables and the quality of life of students. Didactics should know how to establish the tools and mechanisms to develop an effective connection between physical activity and emotional well-being.

5. CONCLUSIONS

The results obtained indicate that the didactics of physical education is constantly evolving, adapting to contemporary needs and challenges. The meta-analysis and meta-analysis of the didactics of physical education has made it possible to identify significant patterns in the scientific production and research trends in this field. Through a comprehensive review of the existing literature, it has been possible to draw conclusions that not only reflect the current state of the discipline, but also illuminate critical areas that require attention and future development. Through the various analyses, it has been possible to identify how physical education has evolved and adapted to contemporary needs, incorporating innovative approaches and methodologies that seek to improve the quality of teaching and the well-being of students.

It was possible to verify that since 2014 there has been a sustained growth in scientific production related to the research category. A considerable increase in the number of publications, indicating a growing interest on the part of researchers and academics in exploring and improving educational practices in this area that demand a more inclusive and effective physical education.

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