

Physical education research trend in the last 100 years: bibliometric analysis and systematic review of Scopus journal database

Tendencia de la investigación en educación física en los últimos 100 años: análisis bibliométrico y revisión sistemática de la base de datos de revistas Scopus

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Abstract. This study carried out a bibliometric analysis and systematic review of the trends in physical education research during the previous 100 years using the Scopus journal database. This research aims to map the academic progress of the discipline and highlight the conceptual and methodological alterations that have occurred. Using the Scopus journal database, papers related to physical education published in the last 100 years were compiled for this bibliometric analysis. Using "physical education" as a search phrase, the article search limited the results to publications published between 1924 and 2023. Exclusion criteria were used to weed out publications that had no relevance to the research's primary topic. Based on their importance and pertinence, 217 articles from a preliminary screening of 43,238 were selected for additional review. Next, this data was examined using the VOS viewer program to look for trends, citation patterns, and institutional contributions. The literature review method was also applied to the top 10 papers, with one being selected as the most cited article over a ten-year period. The literature review approach followed PRISMA guidelines to ensure an open and replicable article selection process. The study's findings demonstrate how physical education has evolved significantly from its original emphasis on militaristic and physical components to a more inclusive and technologically advanced approach that incorporates mental health and inclusion. The study's conclusions provide a standard for further investigation into this field by confirming the value of physical education in promoting both academic achievement and general well-being.

Keywords: holistic approach, educational inclusivity, technological development, educational diversity, physical activity, physical fitness.

Resumen. Este estudio realizó un análisis bibliométrico y una revisión sistemática de las tendencias de la investigación en educación física durante los 100 años anteriores, utilizando la base de datos de revistas Scopus. Esta investigación pretende trazar un mapa del progreso académico de la disciplina y destacar las alteraciones conceptuales y metodológicas que se han producido. A partir de la base de datos de revistas Scopus, se recopiló para este análisis bibliométrico los artículos relacionados con la educación física publicados en los últimos 100 años. Utilizando "educación física" como frase de búsqueda, la búsqueda de artículos limitó los resultados a publicaciones publicadas entre 1924 y 2023. Se utilizaron criterios de exclusión para descartar las publicaciones que no tenían relevancia para el tema principal de la investigación. En función de su importancia y pertinencia, se seleccionaron 217 artículos de un cribado preliminar de 43.238 para una revisión adicional. A continuación, estos datos se examinaron utilizando el programa VOS viewer para buscar tendencias, patrones de citación y contribuciones institucionales. También se aplicó el método de revisión bibliográfica a los 10 artículos más citados, seleccionándose uno de ellos como el artículo más citado durante un período de diez años. El método de revisión bibliográfica siguió las directrices PRISMA para garantizar un proceso de selección de artículos abierto y reproducible. Los resultados del estudio demuestran cómo la educación física ha evolucionado significativamente desde su énfasis original en los componentes militaristas y físicos a un enfoque más inclusivo y tecnológicamente avanzado que incorpora la salud mental y la inclusión. Las conclusiones del estudio proporcionan un estándar para futuras investigaciones en este campo al confirmar el valor de la educación física en la promoción tanto del rendimiento académico como del bienestar general.

Palabras clave: enfoque holístico, inclusividad educativa, desarrollo tecnológico, diversidad educativa, actividad física, condición física.

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Introduction

Physical education in the context of formal education is a major concern in improving students' fitness and growth and development (Mayorga-Vega & Viciano, 2015). Physical education has experienced significant development, in physical fitness, health, and overall physical education (Gujarro-Romero, Mayorga-Vega, Casado-Robles, & Viciano, 2020). In its development, physical education also has a role in improving students' academic achievement, discipline and psychological well-being (Vedøy, Anderssen, Tjomsland, Skulberg, & Thurston, 2020). This helps change society's perception of physical education from just physical activity to an integral part of holistic education (Li & Zhong, 2022).

Over the past few decades, research trends in the field of physical education have increasingly involved social and cultural dimensions (Ramos-Álvarez, García-Romero, & Arufe-Giraldez, 2024). Research is beginning to consider the role of gender in sport participation (Khramtsov & Morgachev, 2023), the impact of physical activity on specific ethnic groups (Frasson, Madela, Tavares, & Wittizorecki, 2021), and how culture can influence perceptions of and participation in physical activities (Ava, Rubie-Davies, & Ovens, 2013). This reflects changes in society's view of physical fitness as a result of cultural and social changes that have occurred over time (Kuvaldin, Anikeeva, & Opanasyuk, 2018). In the last few decades, research in the field of physical education has increasingly focused on the

integration of technology in learning (Feng, 2022). Utilization of apps, wearable devices and online platforms is becoming an increasingly important topic (Serova, Tropina, Golubeva, & Karfidova, 2018). This opens up new opportunities in designing physical education programs that are more interactive and relevant to modern lifestyles (Yaakop, Koh, & Yasin, 2023).

In line with this, the development of technology that has developed to date has become a learning medium in physical education (Khajornsilp, Mahaniyom, & Kenjaturas, 2021). Currently, technology-based learning media such as smartphones, tablets, laptops, projectors, and so on, are an appropriate choice for physical education (Fazio & Isidori, 2021; Korelskaya, Varentsova, & Ilyushchenko, 2021). The graphics provided by the technology bring its own appeal to students, especially at the elementary school level (Palao, Hastie, Cruz, & Ortega, 2015). The digitalization that occurs in physical education today provides a fun learning experience for students (Shafieek, Ismail, & Razali, 2024).

Attention to inclusivity and diversity in physical education is also starting to increase (Fernández & Camargo, 2021). Research seeks to understand how to provide environments that support the participation of all individuals, including those with special needs (Alhumaid, 2023). This reflects the spirit of creating inclusive and effective physical education for all students, regardless of their background or abilities (Penney, Jeanes, O'Connor, & Alfrey, 2018). This is also a obstacles for physical education teachers when transferring knowledge to inclusive students in physical education diversity (Alfalih, Kauffman, Ragmoun, & Alfalih, 2024).

Research in the field of physical education has gone through various phases of development that reflect changes in society's understanding and values of physical fitness (Harris, Cale, Duncombe, & Musson, 2018). Starting from the focus on physical activity at the start of implementation to attention to social health (Parris, Cale, Harris, & Casey, 2022) and inclusivity (Moraes, Bastos, & Rodrigues, 2022). These changing research trends reflect the evolutionary dynamics of physical activity and social activities (Savelyeva, Danilova, Karpushkina, & Kilina, 2021). However, the development of physical education research has not yet been systematically mapped (Rief, Oesterheld, & Amesberger, 2022). This bibliometric research aims to look at the development of physical education research trends in the last 100 years with the following research question:

1. To analyze physical education research trends in the last 100 years.
2. To evaluate the most countries contributed physical education research trends in the last 100 years.
3. To discover the subject areas related to physical education research trends in the last 100 years.
4. To analyze the keyword trends of physical education research trends in the last 100 years.
5. To analyze research trends trends of physical education research trends in the last 100 years.
6. To analyze the top 10 cited publications in physical

education research trends in the last 100 years.

Methods

This type of research is a Bibliometric Analysis and Systematic Review. Article searches were carried out using a comprehensive strategy on Scopus research journal databases. The keyword used was "physical education". Furthermore, the exclusion criteria were journals published in the last 100 years from 2023. There were 43,238 articles from Scopus that were mined on November 20th, 2023. Therefore, 217 articles were selected for further analysis by using VOS viewer computer software.

VOS viewer is an application used for bibliometric analysis by mapping research results based on keywords, titles, authors, and others. The analysis carried out using this application requires a file in RIS format. The RIS file is obtained through export results from the Scopus website in accordance with the screening that has been carried out. Furthermore, the file will be entered into the VOS viewer application and carried out bibliometric analysis. This study maps the results of bibliometric analysis based on the keywords of the studies that have been conducted.

The literature review methodology was also carried out on the 10 articles with the most citations, selecting one article with the most citations in each 10 year time period. However, in the first 20 years there were no publications in physical education, so there are 8 publications from the last 80 year period. For standard operationalization, this study follows the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) (Figure 1)

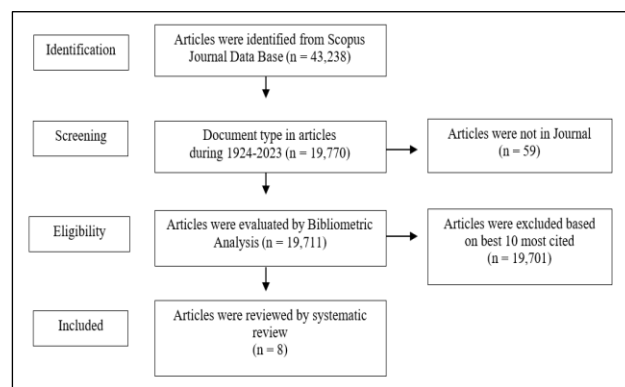


Figure 1. PRISMA flowchart of the article selection process

Results

The research results presented are divided into 6 variables, namely research trends, language, country, affiliation or university, subject areas, and 10 articles with the most citations. The purpose of selecting these variables is to determine the development of trends from the research that has been carried out to date. The dominance of language, country, and affiliation needs to be known to provide knowledge and information to readers. Subject areas and best articles provide a visualization of the research focus that

has occurred so far.

Research trends of physical education in the past 100 years

Research developments in the field of Physical Education over the last 100 years are grouped into a 10 year time span, starting from 1924 to 2023 (Table 1). At the beginning of the 1924-1933 period, it seems that there were no research documents relevant to Physical Education. This may reflect a lack of attention to this subject at the time. However, in the period 1944-1953, we see a significant increase in the number of research documents, by 221, indicating a change in interest in this discipline. Furthermore, the period 1964-1973 saw an impressive spike in the number of research documents, reaching 1,609, indicating a trend of increasing interest in Physical Education in the mid-20th century. In addition, it is possible that in that year physical education began to receive more attention from researchers. The number of studies conducted in these years had an impact on the decline in research conducted in 1974-1983. This is due to the lack of research gaps found in that year, so that only 1,406 studies were obtained, less than the previous decade.

Table 1. Document of physical education publication in the Last 100 Years

Year	f	Total Cited	Average Cited
1924 – 1933	0	0	0.00
1934 – 1943	0	0	0.00
1944 – 1953	221	109	165.00
1954 – 1963	358	547	452.50
1964 – 1973	1609	16374	8991.50
1974 – 1983	1406	8237	4821.50
1984 – 1993	1257	20509	10883.00
1994 – 2003	1354	57324	29339.00
2004 – 2013	3813	127410	65611.50
2014 – 2023	9693	98324	54008.50
Total	19711	328834	174272.50

Data on total citations provide insight into the impact of research in this discipline. The 1994-2003 period was the most striking, with 57,324 total citations, indicating that research in Physical Education has become a significant source of references in the scientific literature. The average citations per document reached its peak in the 1964-1973 period, with a figure of 8,991.50, indicating that documents in that period were very influential in subsequent research. Additionally, this table gives us a look at changes in research trends over the past 100 years.

In recent years (2014-2023), the number of research documents and total citations have continued to increase, indicating that Physical Education remains a relevant and growing subject. The increase that occurred in that year was not as high as in 2004-2013. This condition is based on the rapid digital development in these years. The number of studies in 2014-2023 affected the number of citations in 2004-2013. Finally, although this table does not directly identify contributing countries, citation data can provide clues about the countries most active in Physical Education research, and this could be the subject of further research to identify the role of these countries in the development of

this discipline. Keyword network map illustrations produced by software such as VOSviewer illustrate changes and developments in physical education research topics in recent years (Figure 2).

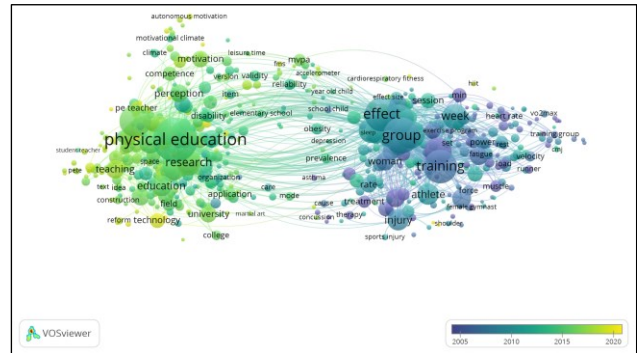


Figure 2. The Development of Physical Education Research

This network map illustrates the relationships between various themes in physical education research. Each dot or “node” represents a particular keyword from a scientific publication, and each line connecting them shows the relationship or connection between the topics. Different colors of the nodes indicate the time periods in which the topic appears most frequently in the literature, indicating shifts in focus in research over time.

In the early 20th century, physical education research tended to focus on fundamental physical aspects, such as physical ability, health, and exercise. Research at this time may favor a more rigid and traditional approach, with an emphasis on fitness, athletic ability, and motor skills. This was in line with the beliefs of the day, which considered physical education as a way to get people ready for physically demanding jobs and military training. When the 20th century came to an end, the emphasis shifted from only physical fitness to a more thorough comprehension of the function of physical education in holistic education. The increasing prominence of topics like instruction, curricula, and teaching strategies indicates the need of a more integrated approach to physical education, which enhances students' mental and emotional health in addition to their physical health.

There was a rise in interest in the social and cultural effects of physical education in the late 20th and early 21st centuries. As physical education moves from being a teacher-dominated activity to a more student-centric experience where students' psychosocial elements are taken into account, topics like motivation, student perceptions, and motivating climate are becoming more relevant. Recent studies have started to broaden their focus to incorporate technology in physical education, emphasizing the use of wearable technologies, online platforms, and mobile applications in the teaching and learning of physical education. This demonstrates how physical education has been adjusted for the digital age, where technology is employed to improve instruction and make learning more individualized and pertinent.

This network map also shows the growing body of research on accessibility and diversity in physical education. This indicates a growing understanding that all children, including those with special needs, should have access to physical education and that a more inclusive approach is required to enable all kids to engage completely. All things considered, this map demonstrates how physical education has developed from a restricted concentration on physical preparedness and fitness to a sophisticated, multidimensional field that interacts with numerous other areas of health and education. This research topic's development demonstrates how our knowledge of health and education has changed over time, as well as how physical education has changed to fit the requirements of students and society at large.

Language

With over 14,000 papers and over 300,000 citations, English is the most commonly used language in physical education journals, according to table analysis (Table 2). This development emphasizes how crucial English is as a global scientific communication language, enabling the sharing of knowledge across geographical and academic borders. This is a reflection of the trends toward globalization in academic research, where the main language of communication for a large, global audience is English. The substantial impact of English-language literature on the field of physical education research is further evidenced by the substantial number of citations. Because of this, English is at the top of the table, which not only indicates how common it is but also how important it is that English-speaking researchers have contributed to the advancement of the field.

Table 2.
Language used in physical education publications in the Last 100 Years

Language	<i>f</i>	Total Cited	Average Cited
English	14743	317293	166018.00
Spanish	1122	7873	4497.50
German	1001	1741	1371.00
Russian	993	475	734.00
Portuguese	702	2153	1427.50
French	415	937	676.00
Italian	184	76	130.00
Polish	147	129	138.00
Czech	124	28	76.00
Chinese	110	62	86.00
Total	19541	330767	175154.00

After English, Spanish and German are the most commonly used languages in physical education literature, with each language having over a thousand publications. Spanish, in particular, has a high citation rate, which in the Spanish-speaking population indicates high-quality research and great regional significance. German has a remarkable citation rate per publication, even with fewer publications than Spanish, indicating the historical impact and constancy of German scholars in this area. Portuguese has a higher amount of citations than Russian, yet both languages exhibit research activity in their respective fields with comparable quantities of publications. It reflects the active scientific in-

teractions and innovations that take place between the Russian and Portuguese-speaking communities of physical education. Despite having less publications and citations than other languages, French, Italian, and Polish are nevertheless widely used in European physical education research. The greater frequency of French than of Italian and Polish may reflect the historical impact and ongoing nature of research in French-speaking nations. The constancy of publications in the three languages, despite the lower numbers, suggests that there is a committed and active research community. It serves as an example of the language diversity seen in physical education research, which represents a range of specialized methods and viewpoints. Their scholarly literature presence preserves the diversity of research contexts and approaches while enhancing scientific discourse.

Lastly, despite having fewer publications and citations, Chinese and Czech researchers are nonetheless active in the field of physical education. In particular, considering China's significant advancements in both economics and education, it is impossible to overlook the potential expansion of Chinese literature on physical education. The fact that Czech and Chinese exist suggests that the field of physical education research is reaching out to other nations with a wide range of linguistic and cultural backgrounds. The literature on physical education will likely be translated into additional languages as globalization grows, highlighting the significance of inclusion in scientific communication. These changes will help advance physical education research, encourage collaboration, and enrich our understanding of physical education globally.

Country contributed to physical education in the last 100 years

The top ten countries in physical education research over the past century have been summarized (Table 3). The United States leads with a substantial number of publications and citations, reflecting its position as a center of excellence and innovation in physical education. The high citation average for each publication indicates the deep influence and widespread acceptance of research originating in this country. This shows that research conducted in the US is not only extensive, but also consistently makes important contributions to global knowledge in physical education.

Table 3.
Top 10 Countries Contributed to Physical Education Research

Country	<i>f</i>	Total Cited	Average Cited
United States	4128	124971	64549.50
Spain	1829	22989	12409.00
United Kingdom	1300	43917	22608.50
China	1222	4693	2957.50
Brazil	1130	7905	4517.50
Australia	971	33904	17437.50
Germany	793	8198	4495.50
Canada	614	19434	10024.00
France	544	12592	6568.00
Russian Federation	496	729	612.50
Total	13027	279332	146179.50

Spain and the UK followed with significant contribu-

tions, demonstrating the vitality of physical education research in Europe. The amazing amount of citations from both nations shows the caliber and significance of their study on a global scale. As a result, English and Spanish have gained significance in the communication of research on physical education, allowing for extensive cross-cultural communication and promoting scientific cooperation. Research from these two countries is regularly discussed in international conversations, underlining the relevance and applicability of its findings beyond their physical bounds.

With several publications demonstrating growing attention to and investment in physical education, Brazil and China are considered developing nations in the field of physical education research. Despite having fewer citations than nations in Europe and North America, this shows that they are still developing and have a lot of potential to contribute to science in the future. Their existence demonstrates the variety of approaches and particular obstacles to physical education in various socioeconomic and cultural situations, and it also shows an increasing attempt to broaden the understanding and practice of physical education.

Lastly, the geographic diversity in physical education research and the significant contributions these nations have made to the international literature are exemplified by Australia, Germany, Canada, France, and the Russian Federation. Despite having less citations than world leaders, they nevertheless play a significant role in physical education research because they provide fresh viewpoints and creative ideas to the field. These nations' inclusion in the top ten list attests to the fact that physical education is a genuinely global subject of study, with scholars from all over the globe contributing to continuous advancement and discussion.

On the map showing the contribution of physical education research, Japan and Indonesia appear as active participants even though they are not included in the top ten (Figure 3). Indonesia, with 130 publications, reflects increasing interest and development in the discipline of physical education, indicating the country's efforts to strengthen the physical education component in education and public health. Japan, with 233 publications, demonstrates a strong foundation and continuing tradition in physical education, underscored by the country's commitment to sport and physical health as an integral part of national life. These two countries, although different in the number of publications, both show how physical education has an important place in their research agendas, highlighting their unique and different approaches to physical education.

Affiliation contributed to physical education in the last 100 years

The list of ten leading higher education institutions contributing to physical education research illustrates the importance of academic innovation and knowledge dissemination in this sector (Table 4). Universidad de Granada leads the way with an impressive number of publications and high citations, confirming its position as a center of excellence in

physical education. Loughborough University, known globally for its sports programs, not only produces a high volume of research but also shows wide-ranging impact, as reflected by the number of citations per publication. This together with the contribution of the Universidad de Murcia, marks Spain as an influential country in physical education, underlining the strong traditions and clear focus on this discipline.

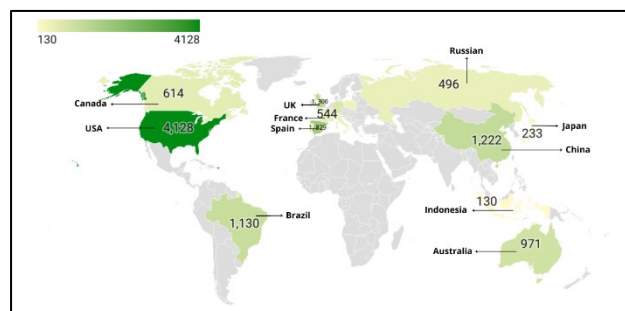


Figure 3. Countries Contributed to Physical Education Research

Table 4.

Top 10 Affiliates Contributed To Physical Education in the Last 100 Years

Affiliations	<i>f</i>	Total Cited	Average Cited
Universidad de Granada	240	2,993	1,616.50
Loughborough University	187	6,920	3,553.50
Universidad de Murcia	183	2,275	1,229.00
Universitat de Valencia	155	1,897	1,026.00
The Ohio State University	127	4,529	2,328.00
Universidad de Castilla-La Mancha	118	1,487	802.50
University of South Carolina	117	4,631	2,374.00
The University of Queensland	117	5,596	2,856.50
University of Limerick	116	2,650	1,383.00
University of Illinois Urbana-Champaign	115	2,157	1,136.00
Total	1,475	35,135	18,305.00

Prominent publications and citations from Universitat de València (UK) and The Ohio State University (USA) attest to their strength in the field of physical education. With an astounding amount of publications, the Universidad de Castilla-La Mancha and the University of South Carolina join the list, highlighting the significance of multidisciplinary methods and the geographic diversity in physical education research. The University of Queensland attests to Australia's inclusion on this list, highlighting the significance of the institution in knowledge advancement as well as the worldwide scope of physical education research. Completing the list are the Universities of Limerick and Illinois Urbana-Champaign, demonstrating the global recognition and importance of physical education research.

These eight universities are representative of the high caliber of research being conducted as well as the volume of citations obtained. These universities' high citation rates show that their work is read, valued, and cited frequently in the academic community in addition to being published. This suggests that these organizations not only contribute to the literature on physical education but also have a significant influence on the course and scope of subsequent studies. Their ability to get international attention is indicative of their profound impact on the development of knowledge regarding successful physical education practices.

All things considered, these universities' inclusion in the top ten list shows how dedicated they are to and successful in reaching the highest standards in physical education research. This highlights the importance of higher education institutions as drivers of innovation and knowledge dissemination in the field of physical education. This success not only cements their reputation as an educational institution but also as a thought leader shaping the future of physical education worldwide.

Subject areas related to physical education in the last 100 years

The various fields of study that contribute to physical education research reveal the multidisciplinary interconnectedness of the field of physical education (Table 5). The health sector topped the list, with a very high number of citations, confirming the intrinsic connection between physical education and health. This reflects the need for an evidence-based approach in physical education that can influence health policy and clinical practice. Health Professions as key contributors highlight the integration of physical education in health education and practice, demonstrating its impact on public health. This area underscores the importance of collaboration between physical educators and health professionals to develop programs that improve physical health.

Table 5.

Top 10 Subject Areas Contributed to Physical Education Research

Subject Areas	f	Total Cited	Average Cited
Medicine	13,885	268,174	141,029.50
Health Professions	7,700	174,886	91,293.00
Social Sciences	5,056	57,538	31,297.00
Psychology	1,409	26,323	13,866.00
Biochemistry, Genetics and Molecular Biology	1,065	22,378	11,721.50
Environmental Science	759	5,278	3,018.50
Arts and Humanities	572	8,872	4,722.00
Engineering	569	3,226	1,897.50
Neuroscience	562	8,890	4,726.00
Computer Science	508	2,697	1,602.50
Total	32,085	578,262	305,173.50

Social Sciences and Psychology emerged as other important fields, showing that physical education not only deals with physical aspects but also social and psychological ones. Research in the social field discusses the influence of social and cultural factors on physical education, while psychology examines the motivation and mental health impacts of physical activity. These two areas help in understanding

how individuals and society view and adopt physical education practices. Biochemistry, Genetics, and Molecular Biology and Environmental Sciences contribute to our understanding of the biological and environmental effects of physical activity. Research from these fields increases our knowledge of how physical activity affects the human body and how environmental factors influence participation in physical education.

Arts and Humanities demonstrate the connection of physical education to our understanding of the human experience, while Engineering highlights innovations in equipment and facilities that support physical education. Neurology explores the relationship between physical activity and brain health, adding another layer to the importance of physical education for cognitive and neurological development. Computer Science introduces technological elements in physical education, with applications and digital platforms that support teaching and training. Together, these fields combine science and innovation to improve the physical education experience and its outcomes.

The interdisciplinary approach reflected in this table confirms that physical education is more than just physical activity; it is a meeting point for various disciplines that collectively enrich and expand the field. From understanding molecular processes to utilizing the latest technology, each field brings a unique and important perspective that helps shape a holistic understanding of physical education. Through collaboration between these fields, physical education continues to develop, not only as an academic field but also as a practice that is important for the physical and mental well-being of society. This diverse and multidisciplinary research is critical to advancing effective and innovative physical education worldwide.

Top 10 cited publications of physical education research in the last 100 years

Overall, the most cited publications (Table 6) in each of these 10 year periods emphasize the importance of physical education that is well integrated into formal education as a way to support comprehensive physical, cognitive and social health. This research encourages a more integrated and evidence-based approach in physical education that not only supports physical goals but also the holistic development of learners. Based on table 6, four main discussion themes can be identified from the ten publications with the most citations in physical education research over the last hundred years. Following are the four themes.

Table 6.

Physical Education Top 10 Cited Publications in the Last 100 Years

No	Year	Author	Total Cited	Research Purposes	Methods	Results
1	1924 – 1933	-	-	-	-	-
2	1934 – 1943	-	-	-	-	-
3	1944 – 1953	(Kireilis & Cureton, 1947)	17	To show how various physical education components relate to body fat as measured by calipers positioned at six different outside locations.	Experimental studies	There were significant negative associations between external body fat and the outcomes of physically demanding exercise, with magnitudes ranging from -0.578 to -0.264 . Compared to other test exercises, the associations with endurance running are somewhat larger. Most strenuous exercises are really hampered by being overweight.

Table 6.
Physical Education Top 10 Cited Publications in the Last 100 Years

No	Year	Author	Total Cited	Research Purposes	Methods	Results
4	1954 – 1963	(Asmussen & Mathiasen, 1962)	15	To investigate over an extended period of time how aging affects particular physiological systems and to assess how physically fit these previously well-trained individuals are in comparison to the general population.	Re-Investigated Study	Exercise that was consistent seemed to delay the decrease. Crucial capacity has decreased much less than expected. Compared to the men, the females have demonstrated a larger loss in their aerobic capacity and muscular strength.
5	1964 – 1973	(Corder, 1966)	37	To look into how a methodical, progressive physical education program affects the social standing, physical growth, and mental development of boys who are mentally challenged but nevertheless able to learn.	Experimental studies	The investigation's findings did not support this theory. The social status of the training group was not significantly impacted by higher IQs or higher levels of physical fitness. Personality issues proved to be the main cause of rejection.
6	1974 – 1983	(Goldberger, Gerney, & Chamberlain, 1982)	29	The study's objective was to assess how effective each of these various teaching strategies was in helping students develop their social and motor abilities.	Experimental studies	It was discovered that all three of these instructional philosophies efficiently assist the learning of this type of motor activity.
7	1984 – 1993	(Sallis & Mc Kenzie, 1991)	430	This essay looks at how physical education can improve the health of adults and children alike.	Literature review	In order to create and evaluate school-based physical education programs that will improve the health of the nation's youth, physical educators must collaborate with public health experts.
8	1994 – 2003	(Ntoumanis, 2001)	601	A number of motivational processes identified by Vallerand (1997) were investigated in this study. Social influences → psychological mediators → motivational types → results are the sequence in which things happen.	Questionnaires	The findings emphasize how important perceived competence and intrinsic drive are when it comes to physical education requirements.
9	2004 – 2013	(Bailey et al., 2009)	425	Examines the theoretical and empirical foundations of claims made on the educational benefits of physical education and school sports (PESS).	Literature review	There is uncertainty about a clear-cut relationship between youth engagement and beneficial outcomes because many of the educational benefits linked to PESS rely largely on contextual and pedagogical factors.
10	2014 – 2023	(Ardoy et al., 2014)	155	To assess how an intervention that aims to extend and enhance Physical Education (PE) sessions affects teens' academic achievement and cognitive functioning.	Experimental studies	Increasing physical education improves cognitive function and academic performance. The degree to which physical education programs are rigorous may have an impact on the positive effects of exercise on cognition and academic achievement.

The Relationship Between Physical Education and Physical Health

Several studies highlight the relationship between physical education components and indicators of physical health, such as their influence on body fat levels and the effects of physical exercise on physiological systems that change with aging. Research in this theme analyzes how various forms of physical exercise, such as resistance training and physically demanding physical activity, are associated with reduced body fat and how consistency in exercise can slow age-related decline in physiological capacity.

Physical Education And Social and Cognitive Development

Another study explored the impact of physical education on social status, physical growth, and mental development, particularly in intellectually challenged boys. This research tries to understand the effect of a systematic and progressive physical education program on social and motor skills, as well as how physical education can improve cognitive function and academic achievement in adolescents.

Physical Education as A Means of Increasing Motivation and Mental Health

Some research concentrates on the motivational and psychological processes associated with physical education, including how social factors and perceptions of competence can motivate participation. This involves an analysis of how perceived competence and intrinsic motivation influence

the need for physical education and how physical education can address personality issues that influence social acceptance in the school environment.

The Role of Physical Education in Holistic Education and Public Health

These studies also review the theoretical and empirical foundations of the benefits of physical education and school sport, and examine the impact of physical education interventions on academic and cognitive achievement. This theme includes an overview of how school-based physical education programs can be designed and evaluated to improve the health of children and adolescents, highlighting the importance of collaboration between physical educators and public health experts.

Discussion

In the past century, research in the field of physical education focused more on physical and militaristic aspects (Tomczak, Bertrandt, Kłos, & Kłos, 2016). At that time, people tended to value physical fitness as the main indicator of health and fitness (Brusseau & Burns, 2018). Research focuses on developing physical abilities (Santos, Silva, & Marques, 2017), injury (Richmond, Kang, Doyle-Baker, Nettel-Aguirre, & Emery, 2016), and also learning methods in physical education (An, 2018). Appropriate learning methods for physical education have developed

dynamically and significantly from year to year (Muarifin, 2022). Evaluations carried out by educators at that time function as perfecting a good learning method in the future (García-Castejón et al., 2021).

Paradigm shifts in physical education research have begun to appear over time (Conceição & Neto, 2017). In the 1960s and 1970s, attention began to shift from a militaristic approach to a more holistic approach to physical fitness (Siegrist, Lammel, Haller, Christle, & Halle, 2013). Current research trends show increased interest in the relationship between physical fitness, mental health, and general well-being (Nopembri & Sugiyama, 2022). Researchers are starting to recognize that physical education is not just about developing physical abilities, but also about creating a healthy, well-rounded lifestyle (Packham & Street, 2019).

In the following decades, research in the field of physical education increasingly developed with the introduction of more advanced technology and scientific knowledge (Hongtao, 2017). Technological developments are opening the door to a deeper understanding of the physiology and biomechanics of the human body (Radwan, Mahmoud, Mohamed, & Ibrahim, 2021). Research is starting to dig deeper into the effects of exercise on the body's organs (Song, Zhao, Finnie, & Shao, 2018), the body's response to various types of fitness (Domaradzki, Koźlenia, & Popowczak, 2023), and even the correlation between exercise and brain development (Kayrgozhin, Aralbayev, Askarovich, Amangeldinova, & Marat, 2022).

The integration of technology in education is becoming increasingly important in the digital era (Marttinen, Daum, Fredrick, Santiago, & Silverman, 2019). Physical education is no exception, with the increasing use of mobile applications, wearable devices and online platforms to support learning and fitness tracking (Almusawi, Durugbo, & Bugawa, 2021). This technology not only enriches students' learning experiences but also allows physical education teachers to design programs that are more personalized, engaging, and suited to modern lifestyles (Leskova, Lei, Peredel'skiy, Barieva, & Maksimova, 2021).

Inclusivity and diversity have become major focuses in recent physical education research (Hutzler & Choresch, 2023). Efforts to create a supportive environment for all individuals (Tristani, Tomasone, Gainforth, & Bassett-Gunter, 2021), including those with special needs, have driven innovation in curriculum design and teaching methods (Mihajlovic, 2017). This research has resulted in the development of more adaptive programs that can meet the needs of a variety of students with different backgrounds, ensuring that every student has an equal opportunity to participate in and benefit from physical education (Thorjussen, 2021). Changes in physical education research also reflect the evolution of physical and social activities (Rodicio-García, Mosquera-González, Penado, & Mateos-Padorno, 2020). From an initial focus on physical activity to attention to social health and inclusivity (Wright, O'Flynn, & Welch, 2018), this research trend highlights the importance of

physical education in supporting students' social development (Munk & Agergaard, 2015). It recognizes that physical education is not just about physical activity (Normand & Burji, 2020); it's also about building social skills (Park et al., 2022), learn to cooperate with others (García, Alavés-González, & Mesa, 2020), and develop respect and empathy (Merica et al., 2022).

Conclusion

The study's findings highlight how physical education has evolved from emphasizing military readiness and physical fitness to taking a more comprehensive approach. In order to stay up to date with changing educational demands, physical education now incorporates elements of social inclusion, mental health, and cutting edge technology. According to this study, physical education has a significant impact on children's social and academic development in addition to helping to maintain their physical health. These results highlight the value of including physical education in the curriculum to help students develop holistically, which encompasses mental, emotional, and physical well-being.

Globally speaking, this study sheds light on how different nations have embraced and modified physical education to promote inclusive and student-centered learning. This emphasizes how crucial cross-border cooperation is for exchanging novel research, best practices, and physical education programs that can adapt to shifting social norms and global concerns. This research sheds light on how physical education is changing in the face of globalization and digitization and provides a forum for scientific and cross-cultural learning.

This research has a wide range of consequences for the subject of physical education. First of all, these results highlight the necessity of more inclusive physical education curricula that can accommodate a range of student demographics, including special needs students. This necessitates the creation of instructional materials and strategies that can adjust to the unique needs of each student and promote their active engagement. Second, there is a chance to modify instruction to fit contemporary lifestyles while boosting motivation and engagement among students by incorporating technology into physical education. Third, in order to create physical education curricula that can enhance students' mental and physical well-being, these results support the collaboration of public health specialists and physical educators. Ultimately, this study opens the door for more research that may examine the connection between physical education and other learning objectives, such as emotional health, social skills, and cognitive ability.

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