



ASIAN JOURNAL OF INTERDISCIPLINARY RESEARCH



Physical Education Research Trends during Pre-Pandemic and Pandemic Period

Jose D. Delas Peñas^{a,*}, Jovito Anito^a

^a College of Education, Jose Rizal Memorial State University, Zamboanga del Norte, Philippines

*Corresponding author Email: josedelaspenas@gmail.com

DOI: <https://doi.org/10.54392/ajir25411>

Received: 20-05-2025; Revised: 22-11-2025; Accepted: 10-12-2025; Published: 27-12-2025



Abstract: This study deals with a comprehensive bibliometric analysis of Physical Education research trends published from 2001 to 2023, based on 1,184 publications indexed in the Scopus® database. Using Excel and VOSviewer, key metrics such as publication trends, geographic distribution, citation impact, and collaboration networks were analyzed. Results indicate a strong concentration of research output in Western countries particularly the United States, United Kingdom, Canada, and Australia where studies were frequently published in high-impact journals and exhibited notable citation performance. Thematic network analysis revealed both the persistence of core research areas and the emergence of new themes during the COVID-19 pandemic, reflecting the field's adaptability and resilience. Dominant topics included physical activity, Physical Education teaching, risk factors among university students, youth development, academic achievement, and teacher attitudes. These findings underscore the urgent need for inclusive, evidence-based strategies to enhance student well-being through Physical Education. The study concludes by advocating for stronger international collaboration and the sustained emphasis on foundational themes, particularly physical activity, to inform globally relevant curricula and programs that remain responsive to dynamic educational and health landscapes.

Keywords: Bibliometric analysis in PE, Physical Education, Physical Education Research, Trends in PE

1. Introduction

Physical Education (PE) is an important component of a school curriculum fostering the all-around development of learners. PE contributes to students' cognitive, emotional and social growth apart from promoting physical competence and movement skills. It has been known to be associated with enhanced academic achievement, adoption of lifelong healthy habits and better emotional self-regulation (UNESCO, 2021; World Health Organization [WHO], 2022). Moreover, due to inconsistent policies, scarcity of resources, and other competing demands, issues concerning the delivery of PE classes and implementation of PE programs existed around the globe. The COVID-19 pandemic that leads to widespread school closures and health-related disruptions underscores the need to look into the PE program. Although scholars have noted the surge of digital learning tools, P.E. usually overlooked in these technological advancements (Casey *et al.*, 2021). Moreover, innovations have emerged like the online fitness instruction and movement-based learning applications, its application especially in low income regions, remains limited.

The pandemic have raise more concerns on the physical inactivity which is considered as a major health threat. The World Health Organization (WHO), as part of its health intervention strategies, pointed out the importance of integrating physical activity in school (WHO, 2020). However, PE initiatives lacks research-based framework to ensure that interventions were effectively delivered to attain its objectives.

The interconnection between education, health and policy necessitates the exploration on how research in PE has evolve over time particularly amid the pandemic. Although analysis were conducted on the field (Wyant *et al.*, 2022; Abantas *et al.*, 2025), still a gap on comprehensive mapping of the thematic landscape and scholar evolution in the field of PE before and during the pandemic exists.



Despite the growing interest of scholars in PE, previous works noted to have methodological gaps. Most works rely on narrative or systemic reviews which lacks the analysis of thematic development and structural patterns. It is also noted that there is lacking studies on how research themes evolve or respond to a particular disruptions like the COVID-19 pandemic. Existing studies also overlook regional differences and collaboration networks among countries. Considering these limitations, this study utilized the combination of bibliometric and thematic analysis to explore more comprehensive perspective of research trends in the field of PE and its connection with other discipline.

This study analyzed research articles published in year 2001 to 2023. The goal is to explore the trends in research productivity, geographic and institutional impact, collaboration patterns, and research themes, particularly during pre-pandemic and pandemic period.

The study was guided by the following research questions:

Questions on Bibliometric Performance

- (1) What is the rate of production of research in Physical Education?
- (2) What is the rate of citation for research in Physical Education?
- (3) Which countries are the primary contributors to Physical Education research?
- (4) What are the primary publication outlets for research in physical education?
- (5) Which countries exhibit strong collaboration in Physical Education research?

Questions on Thematic Network

- (1) What specific themes are prevalently studied in Physical Education?
- (2) How do the themes of Physical Education research connect?
- (3) How did the Physical Education research themes conceptually evolve during the pandemic?

2. Methods

To explore the evolution of research trends on PE curricula and program over time, bibliometric analysis was used, known to help map the landscape of research works in the field. It's a tool to track how research evolve, identify which countries were actively engaged, and seeing how themes were developed and linked each other (Abantas *et al.*, 2025; Bagheri *et al.*, 2023; Barrot, 2017; Van Raan, 2003). This approach allows the visualization of intellectual structure and collaborative trends in the field.

All data were gathered from the Scopus® database, which is widely respected for its comprehensive, peer-reviewed content. With nearly 44,000 indexed sources—about 65% of which are regularly updated—Scopus is often the go-to platform for reliable academic research (AlRyalat *et al.*, 2019; Elsevier, 2020; Visser *et al.*, 2021; Zhu & Liu, 2020). It has a reputation in terms of quality and accuracy of research outputs, which made it a fitting choice for this project (Harzing & Alakangas, 2016).

To identify relevant research publications, Scopus's advanced search function with the following query string was used:

TITLE-ABS-KEY ("Physical Education Curriculum" OR "Physical Education Program").

These exact two terms were used to keep the search focused and relevant. Truncation symbols, controlled vocabulary, or broader synonyms were intentionally avoided to minimize irrelevant results and maintain precision.

Filters were also employed to refine the search. The search limits the dataset to peer reviewed journal articles or reviews published from 2001 to 2023, and written in English. Other articles such as conference proceedings, editorials, grey literature, and non-peer-reviewed items were excluded so as to ensure scholarly rigor. After applying these criteria, 1,184 documents remained from the initial 1,677 which served as the basis for the analysis. The search was conducted on October 24, 2023. Figure 1.

After the documents were identified, the data were examined and analyzed from the different angles. To chart trends in publication, citation patterns, and geographical distribution of research works, Microsoft Excel was



used. The visualizations and summary tables provided insights in terms of production, time, impact, and space metrics.

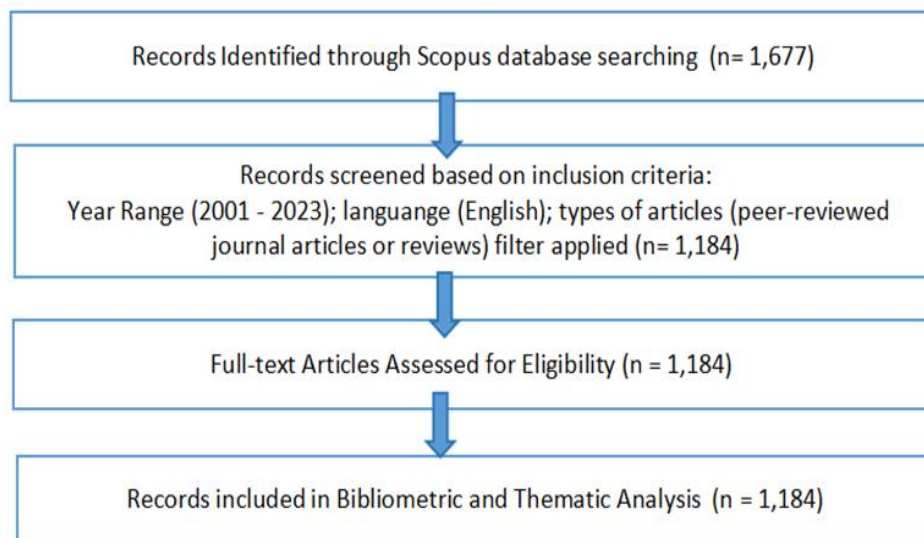


Figure 1. Step-by-step Procedure in Selecting Studies for Analysis

To visualize the collaboration, particularly the co-authorship networks between countries around the globe, VOSviewer was used. VOSviewer provides visuals on the collaboration between countries, calculated through co-author parameters (Abantas *et al.*, 2025). Exploring further on the topic being studied, SciMAT was used, which helps reveal how the different themes emerge, grow, or fade over time. SciMAT is a scientific mapping analysis tool introduced in 2012 by Cobo *et al.*

Furthermore, as introduced by Malik and Siczek in 2023 (Abantas *et al.*, 2025),

SciMAT utilizes strategic diagrams and thematic networks. Strategic diagrams is used to visualize the corpus themes' density and centrality. Centrality measures the theme's interaction level with other themes, meanwhile, density evaluates the robustness of the thematic network, as defined by Callon *et al.* in 1991. Moreover, thematic network was employed to map themes' evolution and corresponding subdomains. Integrating the frameworks of Callon *et al.* and Gutiérrez-Salcedo *et al.* (Abantas *et al.*, 2025), the themes were sorted into four groups based on their positions within the strategic diagram, such as the motor (strong and central), basic (important but underdeveloped), specialized (well-developed but isolated), and emerging or declining. The motor themes positioned in the upper right quadrant (Q1) of the strategic diagram demonstrates strong internal cohesion and extensive interaction level with other themes which indicates high importance in the research field. The specialized themes in the upper left quadrant (Q2) are considered to have limited significance as they are well-developed yet relatively isolated. The left lower quadrant (Q3) is known as the emerging or declining theme, indicates either the development of potential themes or the diminishing importance of existing themes. Finally, the basic themes positioned in the lower right quadrant (Q4) exhibit high centrality but of low density which suggests need for further development.

3. Results

The results and discussion section of the study was presented in two parts, aligning with the two main categories of research questions.

3.1 Bibliometric Performance Analysis

The analysis of bibliometric performance encompasses an evaluation of the rates of production and citation, both on a country-specific basis and in relation to publication venues, along with an examination of the collaboration patterns within research related to Physical Education.

Analysis was conducted using Scopus® metadata, and the data were graphically represented in Excel. The study focused on assessing scientific production, time distribution, spatial distribution, and the impact of scholarly



work in this domain. Scientific production was measured by the number of documents published within Physical Education. Time distribution refers to the analysis period, while spatial distribution pertains to the geographical spread of production across countries and scientific journals. The impact was evaluated based on the number and rate of citations and the H-Index across various units of analysis.

Furthermore, the study emphasized the importance of examining the level of engagement by different countries in the domain of Physical Education, as indicated by their respective rates of research production and the impact of the knowledge they generate. Table 1 presents the top 10 countries and their corresponding rates of production and impact metrics.

Table 1. Production and impact metrics of the most productive countries on physical education research.

No.	Country	f	%	C	CPD	CD	%CD	h-Index	%GSP	%GSC
1	US	356	36%	7877	22	300	84%	45	30%	45%
2	China	196	20%	465	2	83	42%	10	17%	3%
3	UK	89	9%	2031	23	81	91%	26	8%	12%
4	Australia	81	8%	1873	23	68	84%	24	7%	11%
5	Canada	81	8%	1409	17	49	60%	19	7%	8%
6	Spain	47	5%	802	17	41	87%	15	4%	5%
7	Greece	39	4%	767	20	35	90%	14	3%	4%
8	New Zealand	35	4%	666	19	32	91%	14	3%	4%
9	Ireland	34	3%	1005	30	31	91%	16	3%	6%
10	Brazil	30	3%	382	13	24	80%	10	3%	2%

Note: (f) number of documents; (%) percentage relative to total number of documents; (C) number of citations; (CPD) number of citations per document; (CD) number of cited documents; (%CD) number of cited documents relative to total number of documents; (h-index) latest h-index recorded in Scopus; (%GSC) percentage relative to the total global number of citations

The global research output on Physical Education originates from the two leading countries, the U.S. and China. The United States contributes the largest share, accounting for approximately 36% of the production. Regarding the h-index, the United States also demonstrates the highest value at 45, while Ireland records the highest citation per document (CPD) value of 30.

Table 1 illustrates the dominance of the U.S. in Physical Education (P.E.) research, leading in publications, citations, and h-index. China follows with numerous publications but lower citation counts and h-index. The U.K., Australia, and Canada also exhibit significant research output and impact.

Research in physical education is rich and varied globally shaped by Western ways of thinking since most of them comes from Western countries. The result revealed that the United States takes the lead in producing academic research and builds a foundation for scholarly work in field, while China focusing more on producing a large number of publications, however, with less emphasis on international influence. Even though countries like China and Brazil publish a lot of work, their research doesn't always get the same level of recognition, as seen in lower citation numbers. It is important to note that various perspective can widen understanding and fully understand various aspect of PE.

The results suggest that there a need to improve research collaboration and dissemination strategies, to enhance global engagement among scholar and thereby, the impact of their output. Improving research visibility can provide wider perspective and maximize utilization of research findings especially from countries with limited resources. The findings also suggests that there is a need to consider more diverse cultural and theoretical perspectives to ensure that educators and policymakers have wider perspective in designing a more effective PE programs.



Table 2. The major publication venue of studies on Physical Education

Country	Major Source	Publisher	CiteScore	Scimago JR
US	Strategies	Taylor & Francis	0.4	Q4
China	Journal of Physics: Conference Series	IOP Publishing	1	NYA
UK	Sport, Education and Society	Taylor & Francis	6.9	Q1
Australia	Sport, Education and Society	Taylor & Francis	6.9	Q1
Canada	Journal of Teaching in Physical Education	Human Kinetics Publishers Inc.	4.6	Q1
Spain	Frontiers in Psychology	Frontiers Media S.A.	4.5	Q2
Greece	Journal of Sports Medicine and Physical Fitness	Edizioni Minerva Medica	3.3	Q2
New Zealand	Journal of Teaching in Physical Education	Human Kinetics Publishers Inc.	4.6	Q1
Ireland	European Physical Education Review	Sage	7	Q1
Brazil	Journal of Physical Education (Maringa)	Universidade Estadual de Maringa	0.7	Q4

The European Physical Education Review, with a Citescore of 7, is favored by Irish researchers, explaining their high CPD value. UK and Australian scholars prefer the Journal Sports, Education, and Society. In contrast, US and Brazilian scholars often publish in lower-impact journals like Strategies and the Journal of Physical Education, respectively. Ireland's leadership in producing high-impact research in Physical Education reflects its robust research environment and global influence in the field.

It is worth mentioning that despite being the second-largest contributor in the number of papers produced among other countries, the journals in which Chinese scholars published their work have not been ranked by Scimago®. This result may suggest discrepancies between research output quantity and recognized quality, indicating a potential need for increased visibility, recognition, or alignment with international research standards.

The result suggests that there is need for scholars, institutions, and policymakers especially among underrepresented countries in the world to ensure that research works is published in high-quality journals to ensure its visibility. Academic institutions and leaders should provide support and strategize dissemination of research outputs through publications to enhance better outcomes in attaining the goals of PE programs and foster collaborations internationally.

Analyzing scientific output trends from 2001 to 2023, Figure 1a depicts a consistent increase, except for 2023 due to data retrieval timing. The steady incline indicates sustained growth and interest in the field. Figure 1b shows Social Science as the primary contributor to pertinent publications, aligning with Physical Education's interdisciplinary nature. This underscores rich collaboration opportunities within the field, as Physical Education intersects extensively with social sciences. The findings highlight the field's dynamic nature and its relevance across diverse subject areas.

Using VOSViewer, an examination of the degree of collaboration among countries in Physical Education research was conducted (see Figure 2). Scientific output on Physical Education can be categorized into eight distinct geographical clusters. The size of the spheres in the figure denotes the volume of research production, while the lines indicate the degree of interconnectedness based on co-authorship metrics. Each cluster is distinguishable by its unique color. The first cluster prominently encompasses the United States, the second is primarily associated with China, and the third mainly represents Europe. Additionally, it is worth mentioning that the United States emerges as the most favored collaborator among nations. Collaborative efforts in Physical Education studies are widespread across various regions globally, which suggests a global landscape of cooperation and knowledge exchange in the field. The United States is seen to cooperate closely with Singapore and Hong Kong, China exhibits collaborative ties with Thailand and South Korea, and the United Kingdom engages in partnerships with other European nations such as Belgium, Norway, and New Zealand. These indicate a diverse network of international collaboration fostering the advancement of Physical Education studies on a global scale.



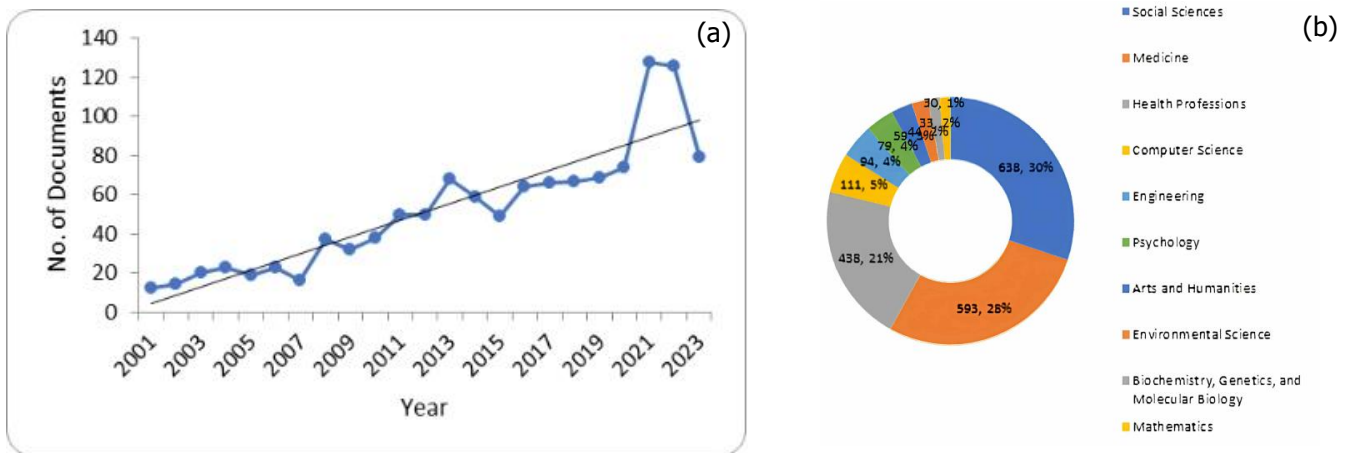


Figure 2. Document distribution in terms of publication year and subject area. **a.** Yearly production of PE Research, **b.** PE Research per subject

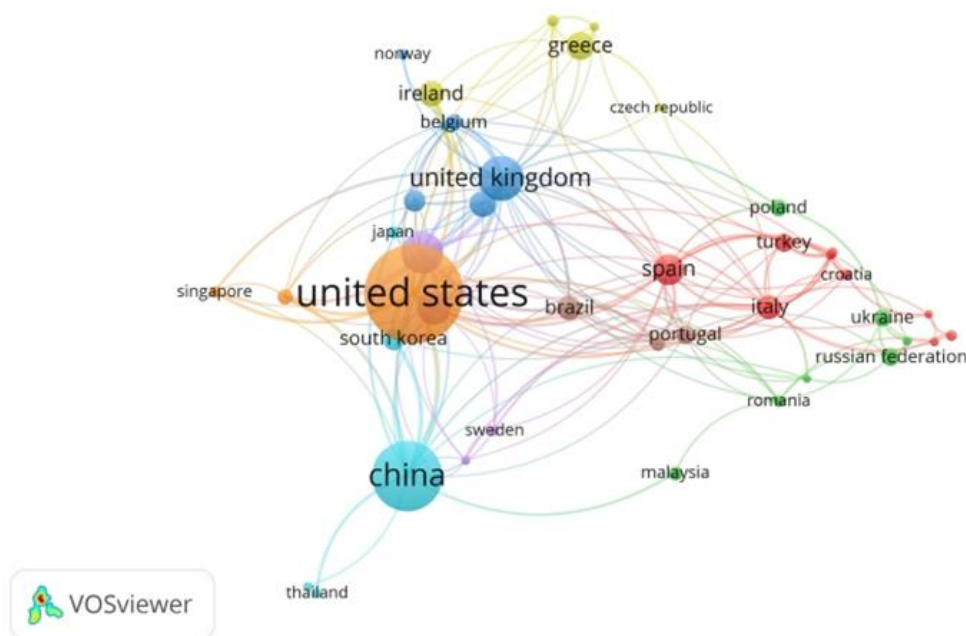


Figure 3. Co-Author Analysis by Country using VOSviewer

Along with other social sciences, research in PE should adopt interdisciplinary collaborations to address various societal issues such as health, learning, and behavior to make sure that research outcomes becomes more impactful to the lives of learners. Collaborations in a global scale can foster partnership which serves as avenue for sharing insights and experiences form different background and context to facilitate the development of more inclusive and effective national programs to address issues in the society.

Physical Education research primarily originates from Western nations like the U.S., UK, Canada, and Australia, leading in citation metrics. This concentration suggests their influence on global discourse and practices. Moreover, Physical Education publications are mostly in high-impact journals, reinforcing the quality and significance of the research. These findings highlight the dominance of Western-centric perspectives and methodologies in shaping global Physical Education scholarship.

The result indicates that Western nations set the international standards in the field, however, this also suggests that other regions in the world can engage in collaboration with these nations, learn together and take opportunity by contributing their perspective and practices through research engagement to ensure that global standards becomes more diverse and inclusive.



Table 3. Link Strength per Collaborative Country

Cluster	Country	Total Link Strength	Average Link Strength
1	Bosnia & Herzegovia	6	13.67
	Croatia	10	
	Germany	10	
	Italy	30	
	Lithuania	10	
	Serbia	4	
	Slovenia	6	
	Spain	33	
	Turkey	14	
2	Denmark	6	7.0
	Kazakhstan	7	
	Malaysia	3	
	Poland	7	
	Romania	9	
	Russian Federation	9	
	Ukraine	8	
3	Belgium	18	18.67
	France	7	
	New Zealand	13	
	Norway	2	
	Taiwan	6	
	United Kingdom	66	
4	Cyprus	8	10.80
	Czech Republic	5	
	Finland	10	
	Greece	12	
	Ireland	19	
5	Australia	51	19.60
	Canada	28	
	Netherlands	2	
	South Africa	8	
	Sweden	9	
6	China	39	12.60
	Japan	6	
	Saudi Arabia	1	
	South Korea	14	



	Thailand	3	
7	Hongkong	16	31.67
	Singapore	10	
	United States	69	
8	Brazil	22	21.33
	Chile	13	
	Portugal	29	

The Table 3 shows the different countries group by cluster based on the extent of their research collaboration. Clusters that includes the United States, Hong Kong, and Singapore has the highest average link strength which indicates their willingness and openness for global partnership. Share language, and cultural ties can also be considered as a driver for academic partnership and connection which is evident for clusters that include Brazil, Portugal, and Chile, as well as Australia and Canada. Moreover, other clusters suggest a room for improving international ties like countries in parts of Asia, and Central and Eastern Europe showing lower connection strength. The results reinforced the idea that few countries plays at the center of research collaboration while others could be benefiting from more integrated global engagement. Scholars around the world, policy makers and the like, can consider the development of programs and strategies that allows collaboration to ensure wider dissemination of findings not only in the field of PE but also in other discipline.

Table 4. Betweenness Centrality of Top Ten Collaborative Countries

Rank	Country	Betweenness Centrality
1	United States	0.303
2	Italy	0.197
3	United Kingdom	0.111
4	China	0.102
5	Canada	0.085
6	Portugal	0.080
7	Romania	0.077
8	Turkey	0.076
9	Hungary	0.074
10	Spain	0.064

Table 4 shows which countries plays important role in international research collaboration connecting wide range of research communities. United States takes the lead, while Italy, UK and China also playing a significant role among others being on top. Interestingly, these nations can be considered as important network builders in the world that can help global research initiatives in the field. The result provides insights for scholar from other countries to seek which country they can foster possible partnership and research collaborations in the future.

Table 5 presents the strongest research partnerships between countries. The results reaffirms that the United States is the center for international collaboration among countries in the field of PE, having six of the top ten bilateral collaborations. It was followed by China, Australia, Canada, and Brazil. The data also shows that while few countries plays a major role in research, international research in the field is increasingly collaborative and diverse. The result provides insights for strengthening the link between countries, and open the doors for other developing countries on the possibilities and avenue for research collaboration with global leaders in the field.



Table 5. Top Ten Bilateral Collaborations

Rank	Country A	Country B	Link Strength
1	Australia	United Kingdom	10
2	United Kingdom	United States	9
3	China	United States	8
4	Australia	United States	7
5	New Zealand	United Kingdom	6
6	Canada	United States	6
7	Ireland	United Kingdom	5
8	Brazil	United States	5
9	South Korea	United States	5
10	Australia	Canada	5

3.2. Thematic Network Analysis

Thematic network analysis was conducted to examine the main themes in research related to the Physical Education. This analysis explored the internal coherence of sub-themes, the interconnectedness of themes, and how these themes evolved over two periods. The tool SciMat, specifically utilizing word co-occurrence and the simple center's algorithm (Coulter *et al.*, 1998), was used to carry out these analyses. The time frame was divided into the pre-pandemic period (2001-2019) and the pandemic period (2020-2023).

Figure 4a presents the changes in themes over the two time periods, showcasing the evolution of themes. Figure 3b and Figure 3c depict the strategic diagrams for the periods before and during the pandemic. Lastly, Figure 3d shows the inclusion index for both periods.

The diagram presented in Figure 4a illustrates the prominent research themes in Physical Education, comparing the themes during the pre-pandemic period (left column) and the pandemic period (right column). In this diagram, a solid line connecting two themes indicates a conceptual relationship, suggesting that the two themes are conceptually similar or belong to the same level of the conceptual hierarchy despite bearing different labels. On the other hand, a broken line indicates a component relationship, implying that the later theme may be included within the former theme or vice versa.

Figures 4b and 4c demonstrate the progression of themes before and during the pandemic, revealing four general categories of thematic evolution. The first category represents the transition within Q1, suggesting that the themes evolved from the pre-pandemic era to the pandemic period. During the pandemic, the themes of RISK-FACTOR, SEX-FACTOR, and ELEMENTARY-STUDENT needed to maintain their previous internal solid coherence and robust external connections. In contrast, the themes of ACADEMIC-ACHIEVEMENT, UNIVERSITY-STUDENTS, PHYSICAL-EDUCATION-TEACHER, and ATHLETES underwent substantial development and emerged as highly significant areas within the field.

Upon closer examination of the conceptual connections, it becomes evident that the themes YOUTH TO ACADEMIC-ACHIEVEMENT, RISK-FACTORS to UNIVERSITY-STUDENTS, ATTITUDE, and PHYSICAL-EDUCATION-TEACHER, and QUESTIONNAIRE to ATHLETE were conceptually similar, despite potentially having different labels in the pre-pandemic and pandemic periods which suggest underlying continuities in crucial research areas despite shifting contexts, highlighting the resilience and relevance of these themes in Physical Education research. Further elaboration on these findings will be provided in the discussion section.

The second type of thematic shift, observed in Q2, involves well-developed themes that eventually become isolated and then transition to highly developed themes during the pandemic, consequently moving to Q1. For instance, the theme "ATTITUDE" demonstrated conceptual similarity with "PHYSICAL-EDUCATION-TEACHER."



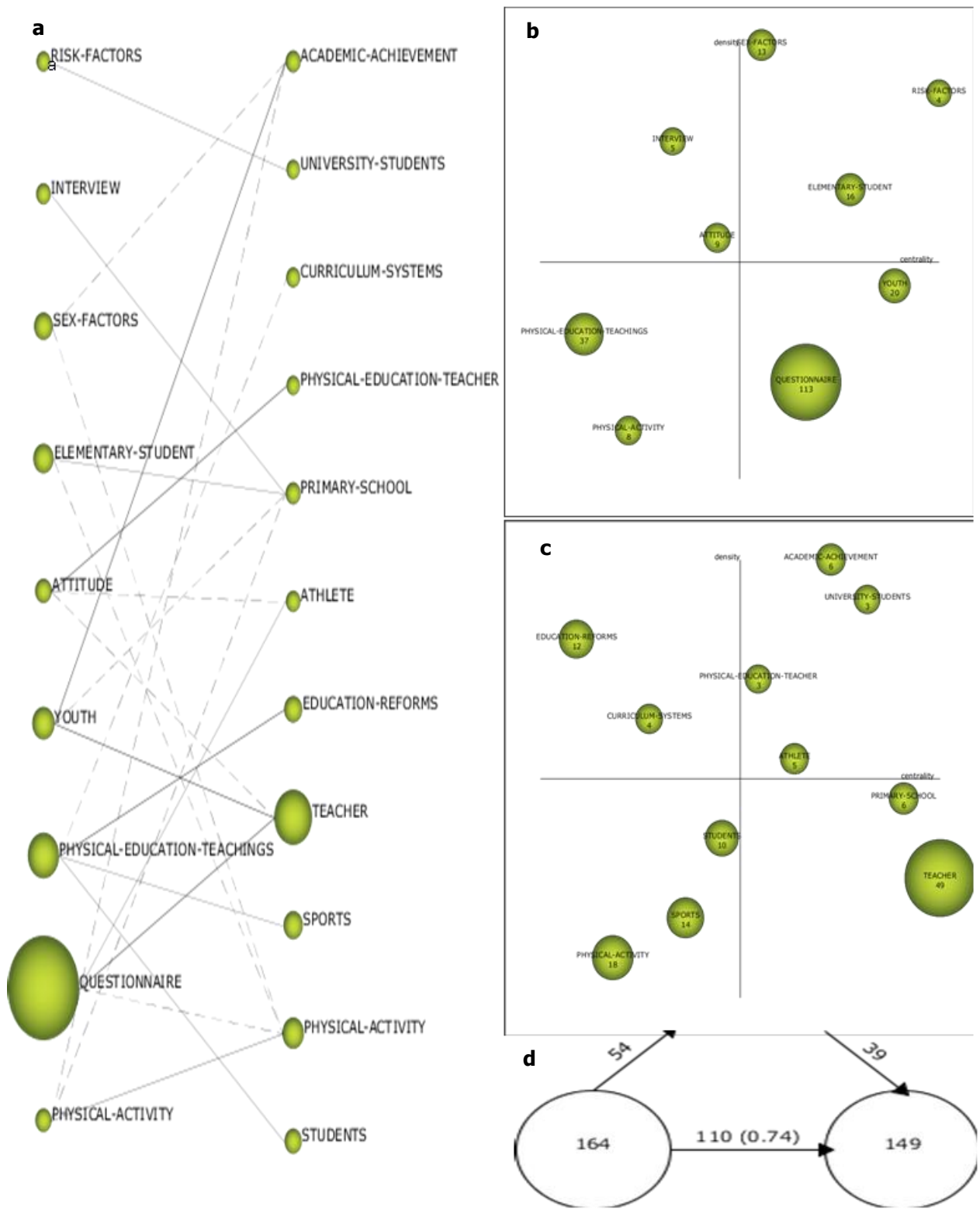


Figure 4. The bibliometric map of themes across pre-pandemic and pandemic periods a. The Evolution Map of Themes from pre-pandemic period to pandemic period, b. Strategic Diagram for Pre-Pandemic Period, c. Strategic Diagram for Pandemic Period, d. Stability Index across two period

Another noteworthy observation emerged in Q3, wherein the theme "PHYSICAL-ACTIVITY" maintained its potential significance during both the pre-pandemic and pandemic periods. In Q4, the themes "YOUTH" and "QUESTIONNAIRE," conceptually linked to "TEACHER," sustained their status as essential themes, although they were not highly developed.



On the other hand, the theme "INTERVIEW," conceptually related to "PRIMARY-SCHOOL," shifted from being highly developed but isolated during the pre-pandemic period to a theme of importance but with less development during the pandemic. These indicate dynamic changes in research priorities and emphases influenced by the pandemic's impact on educational practices and health considerations.

Looking closely at the thematic map in Figure 4b, it can be noted that it remains mostly consistent despite key parameters were adjusted which indicates that the overall structure of the strategic diagram are dependable. Nevertheless, some central themes slightly shifted, the main themes were steady which confirms the trustworthiness of the diagram, hence, conclusion that can be drawn are well-supported. Moreover, the themes in map in Figure 4c, shows solid structure and were not overly dependent on a specific parameters. Themes like *academic achievement*, *university students*, and *physical education teacher* remained central, supporting their importance in the field. Although other themes like *sports* or *physical activity*, shifted a little, the overall structures remains and displays consistency. This observation can provide confidence that findings are reliable, thereby reflecting the structure of the research area.

Figure 4d presents the stability index of thematic evolution. Analysis indicates a high similarity between the research documents before and during the pandemic, with approximately 110 shared keywords, corresponding to a 74% similarity in research content between the two periods. The incoming and outgoing arrows indicate the keywords that have either been added or removed from each period. For instance, 54 keywords in the pre-pandemic period are no longer present, while 39 keywords emerged during the pandemic that were not previously present in the pre-pandemic period.

This result suggests a continuity in specific research themes and areas of focus in Physical Education despite the pandemic. This continuity may be attributed to the resilience of established research priorities and methodologies. Meanwhile, the appearance of new keywords during the pandemic period highlights the field's adaptability and responsiveness to evolving challenges and contexts, potentially reflecting shifts in educational practices, health priorities, or societal needs influenced by the pandemic.

3.2.1. Physical Activity as Emerging And Declining Themes Before And During Pandemic

Increasing student participation in physical activity is an essential indicator of quality Physical Education programs. Physical Education programs provide students with the opportunity to participate in varied physical activities such as sports, to reach students' different interests (Juan *et al.*, 2010; Shephard & Trudeau, 2008).

Physical activity based on the analysis can be viewed from opposing perspectives; at one end, it can be considered as an emerging or a potentially important theme as it is positioned at the lower quadrant in the strategic diagram in both periods; however, on the other perspective, it may also mean a declining theme in terms of its internal development and interconnection with other themes. As an emerging theme, it is beneficial as it addresses the numerous reports on decreasing physical activity participation, especially among the youth, and helps in attaining the primary focus of physical educators on exploring avenues to increase physical activity levels of students and improve their knowledge on the importance of movement (Azzarito & Solomon, 2005; Bertelsen & Thompson, 2014; Lee *et al.*, 2012). It is important to note that this emerging theme directly responds to growing concerns about declining physical activity, particularly among the youth. It may also point out strategies to boost student participation and understanding of movement.

However, its potential decline in development underscores the need for renewed attention and integration within the broader context of Physical Education research to ensure its sustained relevance and impact. These findings relate to a study analyzing a course outline in British Columbia that identified lifetime physical activities as one of the themes that emerged along with authentic assessment, student involvement, value-added options, course design, and a positive-respectful classroom environment (Gibbons, 2009).

Physical activity plays a key role in both primary education and student success, as shown by its strong connection to the themes of PRIMARY-SCHOOL and ACADEMIC-ACHIEVEMENT. In early schooling, physical activity isn't just about movement—it lays the groundwork for lifelong health and development. Physical activities in primary school can help learners develop basic skills such as jumping, running, and object control (Davodi *et al.*, 2014). It



can be noted that during these years, play is important supporting cognitive development, emotional well-being, and social skills along with physical growth (Petrie & Clarkin-Phillips, 2018).

Previous works have also shown a clear connection between physical activity and doing well in school as physically active children usually show better focus, memory, and classroom performance (Basch, 2011; Carlson *et al.*, 2008; Senthil Kumar *et al.*, 2015; Trudeau & Shephard, 2008; Zheng & Zheng, 2023). This suggests that physical activity should be a key part of education not just for health, but also for learning. As Murray *et al.* (2007) point out, academic success should be considered when designing school programs. Moving forward, any efforts to improve student well-being should carefully consider both how often and how meaningfully students engage in physical activity (De Bruijn *et al.*, 2020). This emphasizes the need to ensure that the educational approaches values physical activity not just for health, but as a vital contributor to students' academic performance and overall well-being.

Considering academic achievement, the strategic diagram also revealed the connection of physical activity with other themes, including PEDAGOGY, MOTOR-SKILLS, ADOLESCENCE, and INTERVENTION, which highlights the importance of these themes capturing the interest among scholars to ensure physical activity participation among students by looking at into academic achievement, and explore sound pedagogy, promote motor-skills development, and provide academic interventions if necessary. This finding also connotes that most studies about physical activity focus on adolescents. Furthermore, the connection of physical activity with themes such as pedagogy, motor skills, adolescents, and intervention underscores the interdisciplinary nature of Physical Education research. It also highlights the multifaceted approach needed to ensure student physical activity participation. This connection suggests that scholars are exploring holistic strategies that promote physical activity and address academic achievement by integrating effective pedagogical approaches, fostering motor skills development, and providing interventions when necessary, reflecting a comprehensive approach to student well-being and success.

The analysis shows that some studies focusing on how teaching methods, assessment practices, and academic performance are connected in biomechanics education, with a goal of developing motor skills by engaging learners into a well-planned activities, employing the proper tools, and conducive learning environments (Fyall, 2016; Iivonen *et al.*, 2011; Salvador-Garcia *et al.*, 2022). These insights have helped shape intervention programs designed to boost students' motor performance. Interestingly, seventy-six of the studies reviewed in this analysis focused on adolescents. This is important because earlier research raised concerns about whether physical education programs were truly effective in encouraging lasting physical activity habits among teens (R. Moore *et al.*, 2023).

These result pointed out the need for continued research improving the delivery of instruction making sure that it connects with adolescents, promoting skills development and health behaviors. Moreover, the result can provide insights to educators and policymakers to effectively integrate physical activity and school curricula as fundamental in ensuring academic achievement, and over-all well being. Additionally, the association of physical activity with pedagogy, adolescence, and intervention suggests an interdisciplinary approach in alingning effective teaching strategies, developmental needs and long-term behavioral goals.

3.2.2. Physical Education Teaching and Reforms

The analysis reveals a significant changes in the teaching approaches in PE as it shift towards integrating technologies and innovative instructional interventions (Zhong *et al.*, 2021; Li, 2014; Sun, 2016; Zhang *et al.*, 2010; Zhang, 2022; Liu & Zhuang, 2022; Teng & Cai, 2021; Wang, 2021). The development includes the use of offline and online platforms, computer-aided instruction, multimedia, and utilization of machine learning and artificial intelligence applications which aims to enhance delivery of instruction and make instruction more interactive and personalized.

Apart from technology-driven strategies, other pedagogical innovations were also identifield such as the Game Concept Approach, Inquiry-Based, incorporation of traditional folk dance games, and other constructivist teaching methods (Rossi *et al.*, 2007; Li, 2014; Yuan *et al.*, 2020; Yang, 2021). It can be noted that these approaches allows students to engage in more meaningful, relevant, and learner-centered learning experiences. These trends suggest that teaching PE evolve to a more dynamic and adaptive to existing needs and societal contexts.

The association between educational reforms and teaching PE emphasizes the growing awareness on the major health challenges nowadays, the student inactivity (Basch, 2011; Solomon, 2015). As schools plays important role in addressing societal issues, hence, a thoughtful approach to physical education is encouraged which also



consider fitting to a larger educational system, hence, teaching PE must also cope with educational reforms across all levels. Reforms may include more funding and time for PE in basic education and ensuring that higher education are more responsive and innovative to address current challenges (Yli-Piipari, 2014; Sun & Shan, 2021; Xu, 2012).

3.2.3. Risk Factors Affecting University Students

Studies on health-related risk factors have already emerged as an established and critical theme before pandemic with its connection with university students, the trend continued even during the pandemic as shown by its steady position in the strategic diagram.

The risk factors identified in the analysis usually studied together with other themes such as health surveys, time-related behaviors, cardiovascular issues, and case-control study designs. With the importance of physical education in promoting well-being of students, scholars have identified key risk factors, such as the high blood pressure and central obesity which contributes to a more serious conditions like metabolic syndrome (Marić *et al.*, 2013; Piotrowski, 2013; Ho *et al.*, 2022). Other factors were also identified that exposes individual to of developing disease such as diabetes were body mass index (BMI), age, sex, alcohol and tobacco use, eating habits, educational level and physical activity levels (Lopez Sanchez *et al.*, 2022). These results emphasizes the value of implementing physical education programs religiously, integrating early intervention and awareness to prevent long-term health issues and improve fitness.

The link between health risk factors and university students suggests the need to ensure students well-being. The risk factors identified provide insights on the complexity of health challenges encountered by students, hence, physical educations role in promoting healthier lifestyle is with utmost importance.

Amid the pandemic, research based in higher education institutions focused their works on students engage in physical activities exploring wide range of topics including motivation, sports participation, and the impact of physical activity programs (Sad *et al.*, 2011; Chen & Liu, 2008; Choi *et al.*, 2021; Chin-Cheng *et al.*, 2022; Hashem Mohamed, 2016; Puen *et al.*, 2021; Li *et al.*, 2014; Giovannelli & Bandeira, 2023; Mo, 2017; Liao *et al.*, 2023; Lazăr & Leuciuc, 2021; Yang *et al.*, 2023a; Crawford, 2015; Yang, 2021; Mendez-Cornejo *et al.*, 2021; Hamdan Hashem Mohammed, 2018; Podstawski *et al.*, 2021). These works allows scholars to understand the need, behaviors and motivation of students during pandemic which served as basis in developing strategies and intervention in promoting health and academic success in the higher education setting.

The findings suggests that there is a need to prioritize the integration of technology and culturally relevant teaching strategies to ensure PE is more engaging, while addressing the health risks. Furthermore, it can be noted that interdisciplinary collaboration between education and public health can enhance efforts by supporting both academic engagement and well-being of learners.

3.2.4. The Youth and Academic Achievement

Youth, as a theme emerged as either a rising or declining theme before the pandemic with indicates that scholars were either dismissing its focus or beginning to explore its potentials, however, during the pandemic it was observed to get connected with academic achievement which a well-established and critical theme. The transition illustrates the rising attention provided to young individuals' experience in PE as it comprises the majority of participants in research conducted exploring the impact of PE programs.

Various studies explored different aspect of youth involvement in PE that covers wide range of concerns such as gender, race, and social class differences, targeted programs for specific cohorts such as youth with autism and juvenile offenders, and innovations such as virtual PE and Exergams (Azzarito & Solomon, 2005; Hilgenbrinck, 2003; Vagheti *et al.*, 2018; Pitetti *et al.*, 2007; D'Agostino *et al.*, 2021). Other works focus on fitness testing, obesity, critical and creative thinking, enjoyment, early learning experiences, motivation, and healthy lifestyle promotion (González-Calvo *et al.*, 2022; Keating, 2003; Hodge *et al.*, 2019; Lodewyk *et al.*, 2009; Kirk, 2005; Trost, 2004). These works reflects the diversity of PE research with its links with personal development, education, and well-being.

Studies have also emphasize the role of quality teaching, learner-centered approaches, and well-developed school programs enhances academic achievement by engaging students in physical activities. Evidences were also



established that physical education, through implementing school-based intervention, game-based models, and emerging technologies is linked with improve students outcomes (Castelli *et al.*, 2022; Welch *et al.*, 2021; Melero-Cañas *et al.*, 2021; Huang *et al.*, 2022; Stoddart *et al.*, 2023).

The result reaffirms the role of physical education in supporting holistic development, and academic success among the youth. The findings also suggest that PE can be viewed as key contributor for the holistic development of the youth including academic achievement by ensuring inclusive, students-centered approaches, and integration of innovative practices in the delivery of instruction.

3.2.5. Attitude and Physical Education Teachers

During the pre-pandemic, attitude emerged as a specialized theme in physical education (PE) research. Although it is considered as well-developed theme, it remained relatively isolated which indicates that although researchers recognized its importance, it is not yet a subject for broader PE discussion. This theme was closely linked to physical education teachers, which evolved into a highly influential topic during the pandemic.

The thematic development emphasizes the role of attitudes of teachers, students, and parents contributes to the success of physical education program. It can be noted that positive attitude toward physical activity can flourish through a well-organized programs and curriculum-based intervention (Coulter *et al.*, 2020; Grammatikopoulos *et al.*, 2012; Adamčák *et al.*, 2023).

Studies that explores attitudes in PE have cover various topics including curriculum innovation, program satisfaction, teaching methods, group work, preferences, and social inclusion. These works explores the attitudes as shaped by issues like gender, bullying, and school-based testing, and involves specific populations particularly children with disability, early learners, and youth offenders (Ha *et al.*, 2004; Goudas & Magotsiou, 2009; Rikard & Banville, 2006; Di Nardo *et al.*, 2014; Sparkes *et al.*, 2019; Keating *et al.*, 2021). Based on the findings, it is important to note that positive mindset and attitude towards physical education is important for a more effective, meaningful and long-term behavioral change.

The challenges posed by the shift on the delivery of instruction to remote learning due to pandemic, physical education teachers gained prominence in research. Various studies on PE, emphasized the important role of teachers in designing, adapting and implementing effective instruction (Chen *et al.*, 2017; Gadais *et al.*, 2023; Kirk, 2017). Research works also explored the role of teachers in addressing students disabilities, and other topics encompassing inclusive learning, teacher education and training, innovative teaching models, and learning theories (Grenier *et al.*, 2014; Culpan, 2017; Fletcher & Baker, 2015; Dyson, 2002; Walker & Johnson, 2018). Furthermore, other topics involving PE teachers, covers professional development, use of digital learning tools, inclusive education, gender equity, and impact PE on students self-esteem and physical activity levels (Alfrey *et al.*, 2012; Irwahand *et al.*, 2022; Lai *et al.*, 2010; R. Moore *et al.*, 2023). These studies suggests the importance of equipping PE teachers with knowledge, tools and support systems to succeed amid any disruptions or situations.

The thematic analysis emphasizes the role of physical education as important component of holistic development impacting the students' physical, social and academic growth. The themes such as positive attitudes, teacher involvement, equity and innovation were crucial for ensuring lifelong engagement and well-being. The findings also suggests an interdisciplinary efforts, investments in inclusive education, teacher development, responsive PE programs which cater the diverse needs of learners in any setting.

4. Discussion

The result emphasize that the publication of scholarly works influence the dissemination and impact of studies in PE. Scholars from Australia and Ireland published their works in high quality outlets which significantly boost their visibility worldwide, while other countries such as Brazil, Chine and the US more often published in lower-tier or regional venues that limits broader exposure. Increasing global influence in building policies and practices requires scholars to published with greater impact (Mooney *et al.*, 2020; Santos & Lima, 2021). Hence, there is a need for scholars worldwide to consider publication avenues for wider dissemination of research findings and maximize its impact internationally.



The COVID-19 pandemic triggers the shift of research priorities on academic achievement, student's well-being and the important role of PE teachers. This support Murtagh *et al.* (2023) who pointed out the rapid adaptation among teachers to online and blended modalities. Moreover, concerns pertaining to "attitude" and "risk factors" remained a high interest among PE scholars (Jones & Smith, 2022; Patel *et al.* 2021)

Despite the importance of physical activity within PE, it can be considered as underdeveloped theme in both time periods. This affirms previous works which noted that this topic was given less emphasis (Lopez & Chen, 2022; Kumar & Basu, 2019). The result suggest there is a need to refocus physical activity within broader educational and health outcomes (Davis *et al.*, 2022).

The result pointed out that significant teaching reforms in PE primarily integrates the use of technology and other innovative teaching interventions. This findings supports previous works which affirms that technological integration and innovative tools such as multimedia, culturally responsive games, and exergaming emerged (Calderón & MacPhail, 2021; Sargent & Calderón, 2021), however, another concern can also arise such as the inequitable access particularly on the inadequate training for teachers and policy support (Xu, 2012; Wang, 2021).

Health risks concerns among university students also gained more attention before and after the pandemic. This confirms a study which highlights the worsening trend in students health particularly obesity, hypertension, and inactivity especially during the pandemic (Ho *et al.*, 2022; Lopez-Sanchez *et al.*, 2022). Thus, it is important to ensure that PE programs is responsive to the existing needs. PE programs should cover wider aspect of health such as mental health, resilience, and inclusive life skills, rather than just focusing on sports and fitness (Choi *et al.*, 2021; Yang *et al.*, 2023b).

During pandemic, the theme youth was observed to get connected with academic achievement which a well-established and critical theme which indicates the rising attention provided to young individuals' experience in PE. Youth-centered PE research emphasized that PE programs should be inclusive, student-driven and should address inequalities related to ability, race, and gender (Castelli *et al.*, 2022; Stoddart *et al.*, 2023; Azzarito & Solomon, 2005; D'Agostino *et al.*, 2021). Furthermore, new technological advances provides new perspective and promising academic success, however, there is a need to ensure that it aligns with the social-emotional and developmental goals of learners (Huang *et al.*, 2022). Attitudes among teachers, students, and parents towards PE can be considered as a strong determinants of engagement. As pointed by Coulter *et al.* (2020) and Adamčák *et al.* (2023) that teacher plays an important role in fostering equity, belongingness and supportive learning environment (Chen *et al.* 2017; Gadais *et al.* 2023).

This study limits its analysis on existing literatures published. Moreoer, though bibliometric tools such as SciMAT can help illuminate trends of research theme in PE, it may not fully captures the realities in actual classroom practice. Hence, to widen the perspective and deepen the understanding in PE, future research should consider the actual classroom involving the educators, students, and communities to ensure that PE research remains grounded in actual educational context.

6. Conclusion

This study underscores that Physical Education (PE) research remains concentrated in a few dominant countries, particularly the United States and China, where publication volume is highest. However, this concentration highlights a persistent imbalance, as many regions especially those in the Global South are underrepresented in scholarly output. The limited authorship diversity in top-tier journals reflects systemic barriers to global dissemination and participation. To create a more equitable and globally relevant PE knowledge base, there is a pressing need to strengthen international research collaborations and support mechanisms that empower scholars from diverse contexts to share their insights and innovations. Despite the global disruptions caused by the COVID-19 pandemic, core topics in PE research such as physical activity, academic performance, and effective teaching strategies remained consistently central. These findings affirm the enduring value of PE in supporting both educational outcomes and holistic well-being. They also provide actionable insights for educators and curriculum developers, who can design PE programs that integrate physical health, cognitive growth, and personal development. The research further highlights that program effectiveness is enhanced when educators adopt inclusive, student-centered, and culturally responsive practices. Nonetheless, several limitations should be acknowledged. The study's



reliance on Scopus-indexed publications may exclude valuable contributions from non-indexed or regional journals, potentially skewing the global research picture. Additionally, while co-authorship and citation metrics offer useful indicators of influence and collaboration, they do not fully reflect research quality or impact in real-world educational settings. Future studies should expand their scope to explore educational innovations and challenges in underrepresented regions, examine the practical outcomes of school-based reforms, and assess how technology and interdisciplinary approaches can strengthen PE delivery. For PE to remain relevant and impactful across diverse educational landscapes, research and practice must prioritize inclusivity, embrace multiple perspectives, and remain grounded in equity and real-world application.

References

- Abantas, J. C., Akmad, S. E., Bonggat, R. B., Jr., Abubakar, A. U., Nuruddin, N. H., Hajan, B. H., Ayangco-Derramas, C., & Anito, J. C., Jr. (2025). Distance learning in focus: A bibliometric and thematic network analysis of the global research trends. *International Journal of Learning, Teaching and Educational Research*, 24(4), 513–532. <https://doi.org/10.26803/ijlter.24.4.34>
- Adamčák, Š., Šimonek, J., & Magurová, D. (2023). Teachers' attitudes toward physical education and their impact on inclusive practices. *Journal of Physical Education and Health*, 12(1), 45–55. <https://doi.org/10.5507/jpeh.2023.012>
- Alfrey, L., Cale, L., & A. Webb, L. (2012). Physical education teachers' continuing professional development in health-related exercise. *Physical Education and Sport Pedagogy*, 17(5), 477–491. <https://doi.org/10.1080/17408989.2011.594429>
- AlRyalat, S. A. S., Malkawi, L. W., & Momani, S. M. (2019). Comparing bibliometric analysis using PubMed, Scopus, and Web of Science databases. *Journal of Visualized Experiments*, 152. <https://doi.org/10.3791/58494-v>
- Azzarito, L., & Solomon, M. A. (2005). A reconceptualization of physical education: The intersection of gender/race/social class. *Sport, Education and Society*, 10(1), 25–47. <https://doi.org/10.1080/135733205200028794>
- Bagheri, B., Azadi, H., Soltani, A., & Witlox, F. (2023). Global city data analysis using SciMAT: A bibliometric review. *Environment, Development and Sustainability*. <https://doi.org/10.1007/s10668-023-03255-4>
- Barrot, J. S. (2017). Research impact and productivity of Southeast Asian countries in language and linguistics. *Scientometrics*, 110(1), 1–15. <https://doi.org/10.1007/s11192-016-2163-3>
- Basch, C. E. (2011). Physical Activity and the Achievement Gap Among Urban Minority Youth. *Journal of School Health*, 81(10), 626–634. <https://doi.org/10.1111/j.1746-1561.2011.00637.x>
- Bertelsen, S. L., & Thompson, B. (2014). It's Time to Include Nutrition Education in the Secondary Physical Education Curriculum. *Strategies*, 27(1), 3–8. <https://doi.org/10.1080/08924562.2014.858528>
- Calderón, A., & MacPhail, A. (2021). Technology integration in physical education teacher education: A systematic review. *European Physical Education Review*, 27(2), 301–320. <https://doi.org/10.1177/1356336X20924245>
- Callon, M., Courtial, J. P., & Laville, F. (1991). Co-word analysis as a tool for describing the network of interactions between basic and technological research: The case of polymer chemistry. *Scientometrics*, 22(1), 155–205. <https://doi.org/10.1007/BF02019280>
- Carlson, S. A., Fulton, J. E., Lee, S. M., Maynard, L. M., Brown, D. R., Kohl III, H. W., & Dietz, W. H. (2008). Physical education and academic achievement in elementary school: Data from the early childhood longitudinal study. *American Journal of Public Health*, 98(4), 721–727. <https://doi.org/10.2105/AJPH.2007.117176>
- Casey, A., Goodyear, V. A., & Armour, K. M. (2021). *Digital technologies and learning in physical education: Pedagogical cases*. Routledge. <https://doi.org/10.4324/9781003032873>
- Castelli, D. M., Centeio, E. E., & Nicksic, H. M. (2022). Equity and physical education: Building a foundation for all students. *Research Quarterly for Exercise and Sport*, 93(1), 10–19. <https://doi.org/10.1080/02701367.2021.1950615>
- Chen, A., & Liu, X. (2008). Expectancy beliefs and perceived values of Chinese college students in physical education and physical activity. *Journal of Physical Activity and Health*, 5(2), 262–274. <https://doi.org/10.1123/jpah.5.2.262>
- Chen, A., Zhang, T., Wells, S. L., Schweighardt, R., & Ennis, C. D. (2017). Impact of teacher value orientations on



- student learning in physical education. *Journal of Teaching in Physical Education*, 36(2), 152–161. <https://doi.org/10.1123/jtpe.2016-0027>
- Chin-Cheng, Y., Ching-Te, L., & Ting-I, L. (2022). The Effect of Multimedia Teaching Intervention on Physical Education Curriculum on University Students' Sports Attitudes and Sports Behaviors. *Annals of Applied Sport Science*, 10(2). <https://doi.org/10.52547/aassjournal.1046>
- Choi, S. M., Sum, K. W. R., Leung, F. L. E., Wallhead, T., Morgan, K., Milton, D., Ha, S. C. A., & Sit, H. P. C. (2021). Effect of sport education on students' perceived physical literacy, motivation, and physical activity levels in university required physical education: a cluster-randomized trial. *Higher Education*, 81(6), 1137–1155. <https://doi.org/10.1007/s10734-020-00603-5>
- Cobo, M. J., López-Herrera, A. G., Herrera-Viedma, E., & Herrera, F. (2012). SciMAT: A new science mapping analysis software tool. *Journal of the American Society for Information Science and Technology*, 63(8), 1609–1630. <https://doi.org/10.1002/asi.22688>
- Coulter, M., McGrane, B., & Woods, C. (2020). 'PE should be an integral part of each school day': parents' and their children's attitudes towards primary physical education. *Education 3-13*, 48(4), 429–445. <https://doi.org/10.1080/03004279.2019.1614644>
- Coulter, M., McGrane, B., & Woods, C. (2020). 'PE should be an integral part of each school day': parents' and their children's attitudes towards primary physical education. *Education 3-13*, 48(4), 429–445. <https://doi.org/10.1080/03004279.2019.1614644>
- Crawford, S. (2015). Examining the process of university–school–community collaboration in an Irish Sports Studies and Physical Education context. *Irish Educational Studies*, 34(2), 145–163. <https://doi.org/10.1080/03323315.2015.1025555>
- Culpan, I. (2017). Criticality in physical education teacher education: Do graduating teacher standards constrain and or inhibit curriculum implementation? *Australian Journal of Teacher Education*, 42(7). <https://doi.org/10.14221/ajte.2017v42n7.6>
- D'Agostino, E., Ma, S., & Beard, M. (2021). Inclusive physical education: Addressing disparities through student-centered approaches. *Journal of Physical Activity and Health*, 18(6), 723–730. <https://doi.org/10.1123/jpah.2020-0492>
- Davis, R. J., Martinez, C. R., & Brusseau, T. A. (2022). Rethinking physical activity in schools: A whole-child approach. *Health Education Journal*, 81(1), 3–17. <https://doi.org/10.1177/00178969211026330>
- Davodi, N., Salman, Z., & Zareian, E. (2014). The effect of selected primary school games on fundamental skills of locomotion & object control among the boys aged 7-9 years. *Advances in Environmental Biology*, 8(17), 447–452.
- De Bruijn, A. G. M., Kostons, D. D. N. M., Van Der Fels, I. M. J., Visscher, C., Oosterlaan, J., Hartman, E., & Bosker, R. J. (2020). Effects of aerobic and cognitively-engaging physical activity on academic skills: A cluster randomized controlled trial. *Journal of Sports Sciences*, 38(15), 1806–1817. <https://doi.org/10.1080/02640414.2020.1756680>
- Di Nardo, M., Kudláček, M., Tafuri, D., & Sklenaříková, J. (2014). Attitudes of preservice physical educators toward individuals with disabilities at university parthenope of Napoli. *Acta Gymnica*, 44(4), 211–221. <https://doi.org/10.5507/ag.2014.022>
- Dyson, B. (2002). The implementation of cooperative learning in an elementary physical education program. *Journal of Teaching in Physical Education*, 22(1), 69–85. <https://doi.org/10.1123/jtpe.22.1.69>
- Elsevier. (2020). *Discover why the world's leading researchers and organizations choose Scopus*. <https://www.elsevier.com/solutions/scopus/why-choose-scopus>
- Fletcher, T., & Baker, K. (2015). Prioritising classroom community and organisation in physical education teacher education. *Teaching Education*, 26(1), 94–112. <https://doi.org/10.1080/10476210.2014.957667>
- Fyall, G. (2016). Biomechanics, the health and physical education curriculum and confucius? Considerations for teaching, learning and assessment. *Curriculum Matters*, 12, 82–108. <https://doi.org/10.18296/cm.0015>
- Gadais, T., Mahoney, B., & Humbert, M. (2023). Inclusive physical education during the pandemic: The role of teacher support. *Canadian Journal of Education*, 46(1), 97–116.
- Gibbons, S. L. (2009). Meaningful participation of girls in senior physical education courses. *Canadian Journal of Education*, 32(2), 222–244.



- Giovannelli, P., & Bandeira, C. (2023). Physical Education Programmes Improve Sportsman's Motivation, Attitude, and Self-Efficacy: A Mixed Methods Study in Germany. *Revista de Psicologia Del Deporte*, 32(3), 200–211.
- González-Calvo, G., Otero-Saborido, F., & Hortigüela-Alcalá, D. (2022). Discussion of Obesity and Physical Education: Risks, Implications and Alternatives. *Apunts. Educacion Fisica y Deportes*, 148, 10–16. [https://doi.org/10.5672/apunts.2014-0983.es.\(2022/2\).148.02](https://doi.org/10.5672/apunts.2014-0983.es.(2022/2).148.02)
- Goudas, M., & Magotsiou, E. (2009). The effects of a cooperative physical education program on students' social skills. *Journal of Applied Sport Psychology*, 21(3), 356–364. <https://doi.org/10.1080/10413200903026058>
- Grammatikopoulos, V., Gregoriadis, A., & Zachopoulou, E. (2012). Improving children's attitudes and awareness toward a healthy lifestyle in early childhood: A five-european country intervention program. *Advances in Early Education and Day Care*, 16, 109–126. [https://doi.org/10.1108/S0270-4021\(2012\)0000016008](https://doi.org/10.1108/S0270-4021(2012)0000016008)
- Grenier, M., Collins, K., Wright, S., & Kearns, C. (2014). Perceptions of a disability sport unit in general physical education. *Adapted Physical Activity Quarterly*, 31(1), 49–66. <https://doi.org/10.1123/apaq.2013-0006>
- Gutiérrez-Salcedo, M., Martínez, M. Á., Moral-Muñoz, J. A., Herrera-Viedma, E., & Cobo, M. J. (2018). Some bibliometric procedures for analyzing and evaluating research fields. *Applied Intelligence*, 48(5), 1275–1287. <https://doi.org/10.1007/s10489-017-1105-y>
- Ha, A. S. C., Lee, J. C. K., Chan, D. W. K., & Sum, R. K. W. (2004). Teachers' perceptions of in-service teacher training to support curriculum change in physical education: The Hong Kong experience. *Sport, Education and Society*, 9(3), 421–438. <https://doi.org/10.1080/13573320412331302467>
- Hamdan Hashem Mohammed, M. (2018). Effect of a volleyball course on health-related fitness components of university students. *Sport Mont*, 16(1), 41–43. <https://doi.org/10.26773/smj.180209>
- Harzing, A. W., & Alakangas, S. (2016). Google Scholar, Scopus and the Web of Science: A longitudinal and cross-disciplinary comparison. *Scientometrics*, 106(2), 787–804. <https://doi.org/10.1007/s11192-015-1798-9>
- Hashem Mohamed, M. H. (2016). Assessment of a physical education program on health-related fitness and selected biochemical variables of obese male university students. *Indian Journal of Science and Technology*, 9(10). <https://doi.org/10.17485/ijst/2016/v9i10/84339>
- Herrera-Viedma, E., López-Robles, J. R., Guallar, J., & Cobo, M. J. (2020). Global trends in coronavirus research at the time of COVID-19: A general bibliometric approach and content analysis using SciMAT. *Profesional de la Información*, 29(3), 1–20. <https://doi.org/10.3145/epi.2020.may.22>
- Hilgenbrinck, L. (2003). Physical education programs in male juvenile offender facilities - Part I: A descriptive view. *Clinical Kinesiology*, 57(3), 25–41.
- Ho, F. K., Li, A. M., & Wong, W. H. S. (2022). The pandemic's toll on college students' physical health: A global perspective. *Journal of Adolescent Health*, 70(3), 432–438. <https://doi.org/10.1016/j.jadohealth.2021.10.013>
- Hodge, S. R., Murata, N. M., Block, M. E., & Lieberman, L. J. (2019). Case studies in adapted physical education empowering critical thinking. In *Case Studies in Adapted Physical Education Empowering Critical Thinking*. <https://doi.org/10.4324/9780367824488>
- Huang, R., Wang, L., & Zhou, G. (2022). Feasibility on the integrated teaching method of machine learning algorithm inside and outside physical education class. *International Transactions on Electrical Energy Systems*, 2022. <https://doi.org/10.1155/2022/8200907>
- Iivonen, S., Sääkslahtia, A., & Nissinenb, K. (2011). The development of fundamental motor skills of four- to five-yearold preschool children and the effects of a preschool physical education curriculum. *Early Child Development and Care*, 181(3), 335–343. <https://doi.org/10.1080/03004430903387461>
- Irwahand, F. N. E., Mat-Rasid, S. M., Lee, J. L. F., Elumalai, G., Shahril, M. I., & Ahmad, M. A. I. (2022). Perceived barriers to adopting information and communication technology in physical education. *Pedagogy of Physical Culture and Sports*, 26(5), 291–299. <https://doi.org/10.15561/26649837.2022.0503>
- Jones, L. M., & Smith, K. A. (2022). COVID-19 and qualitative PE research: Challenges and adaptations. *Qualitative Research in Sport, Exercise and Health*, 14(1), 45–60. <https://doi.org/10.1080/2159676X.2021.1940913>
- Ju, W. (2023). Effects of gymnastics training on physical fitness of female college students. *Revista Brasileira de Medicina do Esporte*, 29. https://doi.org/10.1590/1517-8692202329012022_0723
- Juan, F. R., Bengoechea, E. G., Montes, M. E. G., & Bush, P. L. (2010). Role of individual and school factors in physical activity patterns of secondary-level spanish students. *Journal of School Health*, 80(2), 88–95. <https://doi.org/10.1111/j.1746-1561.2009.00470.x>



- Keating, X. D. (2003). The current often implemented fitness tests in physical education programs: Problems and future directions. *Quest*, 55(2), 141–160. <https://doi.org/10.1080/00336297.2003.10491796>
- Keating, X. D., Stephenson, R., Hodges, M., Zhang, Y., & Chen, L. L. (2021). An analysis of Chinese preservice physical education teachers' attitudes toward school-based fitness testing in physical education settings. *Physical Education and Sport Pedagogy*, 26(4), 345–358. <https://doi.org/10.1080/17408989.2020.1806994>
- Kirk, D. (2005). Physical education, youth sport and lifelong participation: The importance of early learning experiences. *European Physical Education Review*, 11(3), 239–255. <https://doi.org/10.1177/1356336X05056649>
- Kirk, D. (2017). Health related fitness as an innovation in the physical education curriculum. In *Physical Education, Sport and Schooling: Studies in the Sociology of Physical Education* (pp. 167–181). <https://doi.org/10.4324/9781315410890-9>
- Kumar, P., & Basu, S. (2019). Revisiting the role of physical activity in education: An umbrella review. *Journal of School Health*, 89(11), 889–899. <https://doi.org/10.1111/josh.12831>
- Lai, H.-R., Lee, P.-H., Jhuo, J.-C., Lu, C.-M., Wen, W.-Y., & Chou, W.-L. (2010). Promoting Self-esteem in junior high school students by building teaching indicators: A survey of health and physical education teachers. *Journal of Research in Education Sciences*, 55(1), 127–154.
- Lazăr, A. G., & Leuciuc, F. V. (2021). Study concerning the physical fitness of romanian students and its effects on their health-related quality of life. *Sustainability (Switzerland)*, 13(12). <https://doi.org/10.3390/su13126821>
- Lee, L.-L., Kuo, Y.-C., Fanaw, D., Perng, S.-J., & Juang, I.-F. (2012). The effect of an intervention combining self-efficacy theory and pedometers on promoting physical activity among adolescents. *Journal of Clinical Nursing*, 21(7–8), 914–922. <https://doi.org/10.1111/j.1365-2702.2011.03881.x>
- Li, F., Chen, J., & Baker, M. (2014). University students' attitudes toward physical education teaching. *Journal of Teaching in Physical Education*, 33(2), 186–212. <https://doi.org/10.1123/jtpe.2012-0187>
- Li, Y.-L. (2014). Study on the folk games used in physical education curriculum of school. *Computer, Intelligent Computing and Education Technology - Selected Peer Reviewed Papers From 2014 International Conference on Computer, Intelligent Computing and Education Technology, CICET 2014*, 2, 843–845. <https://www.scopus.com/inward/record.uri?eid=2-s2.0-84896633046&partnerID=40&md5=bc718649e84309b55d474097b438e523>
- Liao, C.-C., Hsu, C.-H., Kuo, K.-P., Luo, Y.-J., & Kao, C.-C. (2023). Ability of the Sport Education Model to Promote Healthy Lifestyles in University Students: A Randomized Controlled Trial. *International Journal of Environmental Research and Public Health*, 20(3). <https://doi.org/10.3390/ijerph20032174>
- Liu, G., & Zhuang, H. (2022). Evaluation model of multimedia-aided teaching effect of physical education course based on random forest algorithm. *Journal of Intelligent Systems*, 31(1), 555–567. <https://doi.org/10.1515/jisys-2022-0041>
- Lodewyk, K. R., Gammage, K. L., & Sullivan, P. J. (2009). Relations among body size discrepancy, gender, and indices of motivation and achievement in high school physical education. *Journal of Teaching in Physical Education*, 28(4), 362–377. <https://doi.org/10.1123/jtpe.28.4.362>
- Lopez Sanchez, G. F., Hernandez, M. R. V., Casas, P. L., Zauder, R., Jastrzebska, J., Skalska, M., Radziminski, L., Jastrzebski, Z., & Pardhan, S. (2022). Impact of physical activity, BMI and sociodemographic and lifestyle factors on the risk of diabetes in 9,511 Ghanaian adults. *Sport TK*, 11. <https://doi.org/10.6018/sportk.518091>
- Lopez, R., & Chen, W. (2022). Physical activity in school settings: A systematic umbrella review. *Physical Education and Sport Pedagogy*, 27(2), 123–140. <https://doi.org/10.1080/17408989.2021.1886264>
- López-Herrera, A. G., Cobo, M. J., Herrera-Viedma, E., Herrera, F., Bailón-Moreno, R., & Jiménez-Contreras, E. (2009). Visualization and evolution of the scientific structure of fuzzy sets research in Spain. *Information Research*, 14(4). <http://informationr.net/ir/14-4/paper424.html>
- Malik, R., & Siczek, M. (2023). HEIs in times of COVID-19: A bibliometric analysis of key research themes. In *Moving higher education beyond COVID-19: Innovative and technology-enhanced approaches to teaching and learning* (pp. 13–28). <https://doi.org/10.1108/978-1-80382-517-520231002>
- Marić, L., Krsmanović, B., Mraović, T., Gogić, A., Sente, J., & Smaji, M. (2013). The effectiveness of physical education of the military academy cadets during a 4-year study. *Vojnosanitetski Pregled*, 70(1), 16–20. <https://doi.org/10.2298/VSP1301016M>



- Melero-Cañas, D., Morales-Baños, V., Manzano-Sánchez, D., Navarro-Ardoy, D., & Valero-Valenzuela, A. (2021). Effects of an Educational Hybrid Physical Education Program on Physical Fitness, Body Composition and Sedentary and Physical Activity Times in Adolescents: The Seneb's Enigma. *Frontiers in Psychology, 11*. <https://doi.org/10.3389/fpsyg.2020.629335>
- Mendez-Cornejo, J., Espinoza, R. V., Chau, G. H., Albornoz, C. U., Gomez-Campos, R., & Cossio-Bolaños, M. (2021). Body fat and aerobic capacity of physical education students from a Chilean university. *European Journal of Translational Myology, 31*(4). <https://doi.org/10.4081/EJTM.2021.10031>
- Mo, D. (2017). Investigation and study on university students' physical education courses, sports facilities needs and teaching satisfaction. *Boletín Técnico/Technical Bulletin, 55*(20), 251–256. <https://www.scopus.com/inward/record.uri?eid=2-s2.0-85038824340&partnerID=40&md5=486ff28417857d5aa3e363a7d9c3e31e>
- Mooney, A., Routen, A., & Cope, E. (2020). Mapping the impact of publication venues in physical education research. *European Physical Education Review, 26*(4), 834–851. <https://doi.org/10.1177/1356336X19897952>
- Moore, R., Edmondson, L., Gregory, M., Griffiths, K., & Freeman, E. (2023). Barriers and facilitators to physical activity and further digital exercise intervention among inactive British adolescents in secondary schools: a qualitative study with physical education teachers. *Frontiers in Public Health, 11*. <https://doi.org/10.3389/fpubh.2023.1193669>
- Murray, N. G., Low, B. J., Hollis, C., Cross, A. W., & Davis, S. M. (2007). Coordinated school health programs and academic achievement: A systematic review of the literature. *Journal of School Health, 77*(9), 589–600. <https://doi.org/10.1111/j.1746-1561.2007.00238.x>
- Murtagh, E. M., Casey, B., & Fairclough, S. J. (2023). Rapid innovation in physical education teacher education during COVID-19: A global perspective. *Sport, Education and Society, 28*(2), 129–143. <https://doi.org/10.1080/13573322.2022.2056567>
- Patel, R., Lee, C., & Thomas, D. (2021). Data collection during COVID-19: Ethical challenges and remote adaptations in PE research. *International Review for the Sociology of Sport, 56*(6), 812–827. <https://doi.org/10.1177/10126902211005903>
- Petrie, K., & Clarkin-Phillips, J. (2018). 'Physical education' in early childhood education: Implications for primary school curricula. *European Physical Education Review, 24*(4), 503–519. <https://doi.org/10.1177/1356336X16684642>
- Piotrowski, S. (2013). Physical education, health and life-long participation in physical activity. In *Issues in Physical Education* (pp. 170–187). <https://doi.org/10.4324/9780203135716-25>
- Pitetti, K. H., Rendoff, A. D., Grover, T., & Beets, M. W. (2007). The efficacy of a 9-month treadmill walking program on the exercise capacity and weight reduction for adolescents with severe autism. *Journal of Autism and Developmental Disorders, 37*(6), 997–1006. <https://doi.org/10.1007/s10803-006-0238-3>
- Podstawski, R., Żurawik, M. A., Clark, C. C. T., Ihasz, F., & Żurek, P. (2021). The intensities of various forms of physical activity in physical education programs offered by universities for female students. *Motriz. Revista de Educacao Fisica, 26*(4). <https://doi.org/10.1590/S1980-65742020000400089>
- Puen, D. A. Y., Cobar, A. G. C., Dimarucot, H. C., & Camarador, R. A. (2021). Perceived barriers to physical activity of college students in Manila, philippines during the COVID-19 community quarantine: An online survey. *Sport Mont, 19*(2), 101–106. <https://doi.org/10.26773/smj.210617>
- Rikard, G. L., & Banville, D. (2006). High school student attitudes about physical education. *Sport, Education and Society, 11*(4), 385–400. <https://doi.org/10.1080/13573320600924882>
- Rossi, T., Fry, J. M., McNeill, M., & Tan, C. W. K. (2007). The Games Concept Approach (GCA) as a mandated practice: Views of Singaporean teachers. *Sport, Education and Society, 12*(1), 93–111. <https://doi.org/10.1080/13573320601081591>
- Salvador-Garcia, C., Chiva-Bartoll, O., Belaire-Meliá, A., & Valverde-Esteve, T. (2022). Motor Performance in School-Aged Children with Autism Spectrum Disorder: Effects of an Extracurricular Physical Education program and socio-ecological correlates. *Journal of Developmental and Physical Disabilities, 34*(2), 355–372. <https://doi.org/10.1007/s10882-021-09802-z>
- Santos, R. M., & Lima, A. C. (2021). Challenges in globalizing physical education scholarship: A view from Brazil. *Physical Education and Sport Pedagogy, 26*(1), 38–51. <https://doi.org/10.1080/17408989.2020.1789571>
- Sargent, J., & Calderón, A. (2021). Exergaming in physical education: Pedagogical promise or digital divide? *Physical*



- Education Matters*, 12(3), 18–25. <https://www.afpe.org.uk>
- Senthil Kumar, E., Kule, K., & Joshi, N. (2015). Relationship between physical fitness and academic performance in school going children's. *Indian Journal of Public Health Research and Development*, 6(4), 180–185. <https://doi.org/10.5958/0976-5506.2015.00223.5>
- Shephard, R. J., & Trudeau, F. (2008). Research on the outcomes of elementary school physical education. *Elementary School Journal*, 108(3), 251–264. <https://doi.org/10.1086/529107>
- Solmon, M. A. (2015). Optimizing the role of physical education in promoting physical activity: A social-ecological approach. *Research Quarterly for Exercise and Sport*, 86(4), 329–337. <https://doi.org/10.1080/02701367.2015.1091712>
- Sparkes, A. C., Martos-Garcia, D., & Maher, A. J. (2019). Me, osteogenesis imperfecta, and my classmates in physical education lessons: a case study of embodied pedagogy in action. *Sport, Education and Society*, 24(4), 338–348. <https://doi.org/10.1080/13573322.2017.1392939>
- Stoddart, A., Mangan, J., & Flory, S. (2023). Inclusive PE for all: Teacher practices that challenge inequity. *Sport, Education and Society*, 28(3), 255–269. <https://doi.org/10.1080/13573322.2022.2109946>
- Süleyman, N. A. D., Acak, M., & Kafkas, M. E. (2011). Contribution of physical education programs to lifelong sport: Evaluating the long-term efficacy of Turkish physical education curricula. *World Applied Sciences Journal*, 15(4), 537–543.
- Sun, Q., & Shan, Q. (2021). Teaching Reform of Sports Dance Course in Ethnic Areas Under the Background of "Intelligent Teaching." *Lecture Notes on Data Engineering and Communications Technologies*, 82, 200–208. https://doi.org/10.1007/978-3-030-80475-6_20
- Teng, Z., & Cai, S. (2021). Application of Computer-Aided Instruction (CAI) in the Physical Education: Survey Analysis of Chinese Universities. *Journal of Healthcare Engineering*, 2021. <https://doi.org/10.1155/2021/1328982>
- Trost, S. G. (2004). School physical education in the post-report era: An analysis from public health. *Journal of Teaching in Physical Education*, 23(4), 318–337. <https://doi.org/10.1123/jtpe.23.4.318>
- Trudeau, F., & Shephard, R. J. (2008). Physical education, school physical activity, school sports and academic performance. *International Journal of Behavioral Nutrition and Physical Activity*, 5. <https://doi.org/10.1186/1479-5868-5-10>
- UNESCO. (2021). *Futures of education: Learning to become – A new vision for education*. <https://unesdoc.unesco.org/ark:/48223/pf0000379707>
- Vagheti, C. A. O., Monteiro-Junior, R. S., Finco, M. D., Reategui, E., & Da Costa Botelho, S. S. (2018). Exergames experience in physical education: A review. *Physical Culture and Sport, Studies and Research*, 78(1), 23–32. <https://doi.org/10.2478/pcssr-2018-0010>
- Van Raan, A. (2003). The use of bibliometric analysis in research performance assessment and monitoring of interdisciplinary scientific developments. *TATuP - Zeitschrift für Technikfolgenabschätzung in Theorie und Praxis*, 12(1), 20–29. <https://doi.org/10.14512/tatup.12.1.20>
- Visser, M., van Eck, N. J., & Waltman, L. (2021). Large-scale comparison of bibliographic data sources: Scopus, Web of Science, Dimensions, Crossref, and Microsoft Academic. *Quantitative Science Studies*, 2(1), 20–41. https://doi.org/10.1162/qss_a_00112
- Walker, E., & Johnson, I. L. (2018). Using Best Practices when Implementing the Cooperative-Learning Theory in Secondary Physical Education Programs. *Strategies*, 31(4), 5–11. <https://doi.org/10.1080/08924562.2018.1465870>
- Wang, Y. (2021). Teacher readiness for integrating digital tools in PE: A systematic review. *Education and Information Technologies*, 26(4), 4329–4345. <https://doi.org/10.1007/s10639-021-10556-8>
- Welch, R., Alfrey, L., & Harris, A. (2021). Creativity in Australian health and physical education curriculum and pedagogy. *Sport, Education and Society*, 26(5), 471–485. <https://doi.org/10.1080/13573322.2020.1763943>
- World Health Organization. (2020). *Global status report on physical activity 2020*. <https://www.who.int/publications/i/item/9789240015129>
- World Health Organization. (2022). *Promoting physical activity through schools: Policy brief*. <https://www.who.int/publications/i/item/9789240062888>



- Wyant, J. D., Keath, A., & Baek, J.-H. (2022). A bibliometric analysis informed reading list for physical educators. *Journal of Pedagogical Research*, 6(3), 1–16. <https://doi.org/10.33902/JPR.202214054>
- Xu, B. (2012). Inequity in technology access in urban and rural PE classrooms in China. *Asia-Pacific Journal of Health, Sport and Physical Education*, 3(1), 55–70. <https://doi.org/10.1080/18377122.2012.666199>
- Xu, X. (2012). The research on network courses education resources integration based on P.E. *Advances in Intelligent and Soft Computing*, 115 AISC(VOL. 2), 483–488. https://doi.org/10.1007/978-3-642-25349-2_64
- Yang, J. Y. (2021). Students' perceptions on constructivist teaching in university physical education of South Korea. *International Journal of Educational Organization and Leadership*, 28(1), 141–154. <https://doi.org/10.18848/2329-1656/CGP/V28I01/141-154>
- Yang, J., Tan, B., & Wang, J. (2023). College physical education post-pandemic: Addressing resilience and life skills. *Frontiers in Psychology*, 14, 1123456. <https://doi.org/10.3389/fpsyg.2023.1123456>
- Yang, W., Zhao, X., & Liu, M. (2023). Exploring the Factors Behind Regional Differences in Physical Fitness of Geological University Students. *Journal of Racial and Ethnic Health Disparities*. <https://doi.org/10.1007/s40615-023-01670-x>
- Yli-Piipari, S. (2014). Physical Education Curriculum Reform in Finland. *Quest*, 66(4), 468–484. <https://doi.org/10.1080/00336297.2014.948688>
- Yuan, W., Shih, K.-T., & Lin, C.-J. (2020). Research on the Integration of Inquiry-based Approach into the Environmental Education of Sustainable Development. *IOP Conference Series: Earth and Environmental Science*, 576(1). <https://doi.org/10.1088/1755-1315/576/1/012012>
- Zhang, X., Li, R., & Zhao, C. (2010). Notice of Retraction: Study of information technology's application in PE teaching in higher education. *ICDLE 2010 - 2010 4th International Conference on Distance Learning and Education, Proceedings*, 241–244. <https://doi.org/10.1109/ICDLE.2010.5605992>
- Zhang, Z., & Zhang, Y. (2022). Research on Effective Strategies of College Physical Education Interactive Teaching Based on Machine Learning. *Applied Bionics and Biomechanics*, 2022. <https://doi.org/10.1155/2022/1843514>
- Zheng, Q., & Zheng, G. (2023). Folk Sports and Physical Education: "Beyond the Classroom" - An Exploration of the Relationship Between Folk Sports Participation and Physical Education in Rural Schools. *Educational Administration: Theory and Practice*, 29(3), 69–92. <https://doi.org/10.52152/kuey.v29i3.811>
- Zhong, C., Zhai, X., & Li, Y. (2021). Research on the teaching of game course in physical education. *International Journal of Electrical Engineering Education*. <https://doi.org/10.1177/0020720920983990>
- Zhu, J., & Liu, W. (2020). A tale of two databases: The use of Web of Science and Scopus in academic papers. *Scientometrics*, 123(1), 321–335. <https://doi.org/10.1007/s11192-020-03387-8>

Author Contribution Statement

Jose D. Delas Peñas: Conceptualization, formal analysis, Validation, investigation, writing - original draft, writing - review & editing, project administration, acquisition. Jovito Anito: Methodology, software, resources, data curation, visualization, supervision, funding. Both the authors have read and agreed to the published version of the manuscript.

Acknowledgement

The authors wishes to extend their gratitude to the Council of Research Development and Extension of Jose Rizal Memorial State University of for approving and allocating funding for this study.

Declaration of generative AI and AI-assisted technologies in the writing process

During the preparation of this work, the author(s) use ChatGPT in order to improve language and readability. After using this tool/service, the author(s) reviewed and edited the content as needed and take(s) full responsibility for the content of the publication.

Does this article screen for similarity?

Yes



Conflict of Interest

The author declares that there exists no competing financial interest or personal relationships that could have appeared to influence the work reported in this paper.

About the License

© The Author(s) 2025. The text of this article is open access and licensed under a Creative Commons Attribution 4.0 International Licenses

Cite this Article

Jose D. Delas Peñas, Jovito Anito, Physical Education Research Trends during Pre-Pandemic and Pandemic Period, Asian Journal of Interdisciplinary Research, 8(4), (2025) 193-215.
<https://doi.org/10.54392/ajir25411>

