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## Teacher competence and preparedness for inclusive physical education (2020-2025): a systematic review of empirical evidence

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### ABSTRACT

Teachers who are knowledgeable, self-confident, and well-trained to teach students with different abilities are a major requirement for inclusive physical education (IPE). However, the information on what determines this readiness is scattered across different disciplines and countries. This systematic review combined peer-reviewed research on the abilities and readiness of physical education (PE) teachers and pre-service teachers for inclusive teaching. The review was based on the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA 2020) guidelines and utilized the Scopus database to retrieve records through a structured Boolean search targeting teacher competence, self-efficacy, preparedness, and inclusive or adapted physical education. Out of 487 records found, 31 empirical studies that were published within the period 2020-2025 met the eligibility criteria after removing duplicates, screening titles and abstracts, and assessing full texts. Records were retrieved from Scopus (search executed December 2025); eligibility followed predefined PICOS criteria, methodological adequacy was appraised with the FICO framework, and findings were combined through thematic synthesis. Screening was conducted with a documented reviewer-agreement procedure. A thematic synthesis grouped the results based on four RQs that covered main competencies, obstacles, and enablers, the impact of teacher education and PD, and pedagogical-technological innovations. Two points were most prominent: self-efficacy through focused training is always changeable, and insufficient, fragmented preparation remains a structural barrier in different systems. The review deepens a situational understanding of inclusive-PE preparedness and gives practical recommendations for teacher-education programs and ongoing PD. Future studies are expected to use longitudinal methodologies, standardized competence instruments and also focus on under-represented regions to strengthen the evidence base.



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## Introduction

Inclusion now lies at the very heart of global educational reform. Changing the notion of a school into merely a place serving only certain types of pupils, inclusion sees a school as a place which has a duty to educate every child in spite of their abilities, and physical education (PE) holds a quite prominent and clear place in this plan because movement, play, and sports are exactly the areas where differences between people are easily noticeable.

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International policy declarations on equal participation have multiplied the pressure on mainstream PE to find ways of including students with disabilities in the same class with other students without disabilities. But actually, making such changes a daily occurrence has been very different from one system or culture to another. Based on comparative policy analysis, it seems that the distance between intending to be inclusive and actually implementing such inclusiveness remains large. This is influenced by issues related to curriculum traditions, resourcing, and even by how poorly defined inclusion itself is (Makopoulou et al., 2022; Engelbrecht et al., 2025; Reina et al., 2016). Since it is the PE instructors who are the closest ones to the situation, the ones who not only understand the notion of inclusion but also make it happen in the gym, their skills and readiness are what actually decide whether inclusive physical education (IPE) will be real and tangible rather than just a statement of intention. Finding out what determines this level of readiness, therefore, is an issue with great educational and public-health importance.

This review focuses on the problem of PE teachers' competence and preparedness for inclusive education. It is a complex component of knowledge, pedagogy, attitudes, and the situated confidence to act. Self-efficacy has been identified as one of the major psychological factors affecting this component because teachers, who downplay their capability to teach, cast doubt on the participation of the students with disabilities even when the policy is to include them. Self-efficacy is a very important factor of how teachers feel prepared and how ready they are to make the change of task, environment and the assessment for the learners with diverse needs, according to the research from different countries (Alhumaid, 2021; Hutzler et al., 2024; Muñoz-Hinrichsen et al., 2025). Nevertheless, competence is not exclusively made up of confidence; it also covers the knowledge of the content and the pedagogy, the skill to understand the complex situations in the class, and the attitude to see inclusion as something that is up to the professional. Without understanding the relationship between these aspects and knowing how they can be developed it becomes difficult to design a teacher training program that really equips the teachers to become inclusive practitioners. Self-efficacy is foregrounded here not as a proxy for competence but as the most frequently measured and demonstrably malleable component of readiness; the review deliberately situates it alongside knowledge, situated judgement, and attitudes to avoid reducing preparedness to confidence alone.

Numerous studies based on real data have explored the preparedness of teachers and pre-service teachers for inclusive physical education (PE), with a large proportion focusing on self-efficacy as the main result and short interventions as the method to increase it. Surveys and studies that involve measuring before and after have consistently shown that well-structured contact with disabled people and adapted physical activity can change efficacy beliefs in quantifiable ways (Alhumaid et al., 2020; Foley et al., 2020; Neville et al., 2020; Grassi-Roig et al., 2022; Picardo et al., 2025a). The value of this literature is that it provides evidence that readiness is a variable which can be influenced by a planned experience rather than being a permanent trait. However, the field has also seen a diversity of views on what competence means, an excessive dependence on self-reporting, and a focus of the evidence in only a few national systems. These characteristics make it hard to come up with tests of cumulative conclusions, and they encourage a systematic synthesis that can chart the terrain, locate agreements, and reveal the limits of existing knowledge.

There has been a diversification of the methods and tools through which inclusive PE is taught and supported in recent years. First of all, the changes brought about by technology and pedagogy have led to the new technologies in teaching and their remote versions, also the combination of digital and physical activities, and new inclusive sports aimed at increasing the participation of marginalised students (Ng et al., 2021; Ng et al., 2025; Kwon et al., 2025; D1 et al., 2025; Lourenço et al., 2025). At the same time, works have been done to improve the tools for assessing inclusive practices and teacher noticing, revealing a more advanced methodological level. It appears that the skill set of today's PE teachers is being broadened to include technological and pedagogical knowledge in addition to the traditional knowledge of adapted activities. However, the rapid release of a large number of new ideas has gone ahead of a thorough evaluation of the extent and manner in which they improve teacher preparedness, thereby leaving instructors and teacher educators without a unified description of which methods reliably develop inclusiveness capabilities.

One of the initial gaps is related to the continual insufficiency of teacher preparation for inclusion, which seems to be a problem throughout the whole process of teacher education and continuous professional development, even after decades of reform. Several qualitative studies reveal that special and inclusive content is only occasionally or very tangentially addressed in teacher training programs; additionally, the quality of field experiences is very variable, and teacher candidates often report that they are not well-prepared to face the realities of diverse classrooms (Celestino et al., 2024; Maher & Fitzgerald, 2020; Erhorn et al., 2020). This repeated observation suggests that the lack of teacher preparation is structural rather than a sporadic issue. However, the circumstances that lead to the success or failure of teacher preparation have not been thoroughly compared. Without such a comparison, the reform initiatives may end up repeating the same shortcomings.

Moreover, the lesson that teacher preparation is the most important factor for inclusive physical education should have a higher priority in both policy and curriculum development but, unfortunately, it has not yet been fully utilized. Theoretical and methodological issues mark a second gap. Besides cross-sectional, single-sites designs, one of the major bases of the evidence is on instruments whose conceptual foundations and cross-cultural validity are still being set up (Hernández-González et al., 2025; Selickaitė et al., 2019; Langer et al., 2022). Thoroughly understanding the field, it appears there is no shared framework that links different aspects of competence with the neat, visible, inclusive behavioral practice and to comparison of student outcomes. Also, the theme bibliometric profiling is characterized by purple, august limited collaboration which also means the field is totally fragmented. That finding individual pieces of work is one thing but geographical and cultural generalization of the results is quite another. The current study presents a systematic review not only to identify the methodological tendencies but also to assess the plausibility of the various claims made against one another, and to specify the conceptual work that, in effect, is still needed to move the field forward.

The urgency of synthesising this literature now becomes even more pressing due to the simultaneous growth of inclusive enrolment, the change in the types of disabilities being taught in mainstream PE, and the very quick introduction of new teaching and technological methods. Teachers still say that they do not have enough information and are not well-prepared even when inclusive placement is a regular thing, and new curriculum changes have brought new challenges without giving the right preparatory support (Hebinck et al., 2023; Burhaein et al., 2020; Suryobroto et al., 2022; Pawlowski & Souza, 2019). In this case, policymakers need a comprehensive, evidence-based description of what improves teacher competence and preparedness, which obstacles most consistently block it, and which interventions and innovations have the highest probability of yielding credible results. This review is an answer to this need by merging scattered discoveries into a unified summary that can be a source of information about teacher training, professional development, and policy in various settings. The review is therefore organized around four research questions. The first one concerns the key competencies and preparedness factors that PE teachers are reported as needing to implement inclusive physical education effectively, including knowledge, skills, attitudes, and self-efficacy (Ben Rakaa et al., 2024a; Giese et al., 2022). To answer this question, one needs to consolidate a description of the attitudes and skills that make inclusive practices possible. This enables a progression from disjoint single-construct studies to a comprehensive mapping of the competence base. By identifying the elements of preparedness and specifying how these have been operationalized in different studies, the synthesis serves as a more explicit objective for teacher educators in curriculum designing and as a well-structured reference framework for researchers in the development of comprehensive measurement frameworks.

The second research question explores the barriers and facilitators that impact PE teachers' preparedness for inclusive physical education. The third question examines the effects of initial teacher education and continuing professional development (CPD) on teachers' competence, self-efficacy, and preparedness (Makopoulou et al., 2021; Park, 2023; Paz et al., 2023; da Silva Filho et al., 2025). Taken together, these questions relate the structural and experiential aspects of inclusive teaching to the intended efforts at broadening it. Identifying the most frequently reported obstacles and which training elements consistently lead to improvements is where their main contribution lies, thus informing the distribution of limited professional-development resources. This twofold attention enables the review to correlate difficulties described with the findings of what actually contributes to the increase in inclusive-PE preparedness. The fourth question of this research is related to what pedagogical and technological innovations can do to support inclusive PE delivery and teacher preparedness. This is a rapidly growing area that is still loosely integrated (Tafari et al., 2025; Alshahrany & Ibrahim, 2021; Tristani et al., 2021; del Rosario Martínez-Aguilera, 2022; Kaplánová et al., 2023; Borges Barbosa et al., 2023; Picardo et al., 2025b). Studying these innovations together with issues of competence, barriers, and training helps the review to locate new tools in the larger work of developing inclusive capacity rather than seeing them simply as isolated novelties. The main originality of this work is to combine four different but related aspects of inclusive-PE preparedness in one PRISMA-guided review which resulted in a contemporary, cross-contextual evidence map that prior studies, focused on single constructs or single systems, have not provided (Koh, 2021; Alhumaid, 2022; Kwon et al., 2022; McNamara et al., 2022; Makopoulou, 2018; Hernández-González et al., 2025).

Building on the foregoing rationale, the review is structured around the following research questions: RQ1: What competencies and preparedness factors are reported as essential for physical education teachers in implementing inclusive physical education?; RQ2: What barriers and facilitating factors influence physical education teachers' readiness to implement inclusive physical education?; RQ3: How do initial teacher education and continuing professional development interventions influence physical education teachers' competence, self-efficacy, and preparedness for inclusive physical education?; RQ4: What role do pedagogical and technological innovations play in supporting inclusive physical education delivery and teacher preparedness?

## Method

### Research Design and Framework

This study adopted a systematic literature review (SLR) design, a method well suited to consolidating dispersed empirical evidence and producing a transparent, reproducible account of the state of knowledge in a defined field. The SLR approach was selected because the questions guiding this review are integrative rather than confirmatory, requiring the identification, appraisal, and synthesis of heterogeneous studies on teacher competence and preparedness for inclusive physical education. Following established guidance for evidence-informed review in applied disciplines (Tranfield et al., 2003; Liberati et al., 2009), the review proceeded through pre-specified stages of identification, screening, eligibility assessment, and synthesis. The Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA 2020) statement provided the organising framework for conducting and reporting the review, ensuring methodological transparency and alignment with contemporary reporting standards (Page et al., 2021).

### Search Strategy

A structured Boolean search string was developed to capture the intersection of physical education teachers, the construct of competence or preparedness, and the inclusive or adapted education context. Truncation was used to capture lexical variants, and the search was applied to the title, abstract, and keyword fields (TITLE-ABS-KEY). The string was iteratively refined through pilot searches to balance sensitivity and specificity, and language and document-type limiters were applied at the database level. The final search string was structured as follows: TITLE-ABS-KEY ( ("physical education teacher\*" OR "PE teacher\*" OR "pre-service teacher\*" OR "adapted physical educat\*") AND ("competenc\*" OR "self-efficacy" OR "preparedness" OR "readiness" OR "attitude\*" OR "training") AND ("inclusive physical education" OR "inclusive PE" OR "adapted physical education" OR "inclusion")). Truncation (denoted by the asterisk) ensured the retrieval of singular, plural, and derivational forms of key terms, while the parenthetical grouping preserved the intended Boolean logic across the three conceptual blocks. The field code TITLE-ABS-KEY restricted matching to the most informative metadata fields, reducing irrelevant retrievals while maintaining comprehensive coverage of the target domain.

### Database and Information Sources

Scopus served as the primary and authoritative information source for this review, selected for its broad multidisciplinary coverage of peer-reviewed literature in education, sport science, and health, and for the structured bibliographic metadata it provides. The search was executed and the records exported in December 2025. Scopus was used as the single database for the core search to ensure consistency of metadata and reproducibility of the record set; the implications of relying on a single database are acknowledged among the limitations of this review.

### Eligibility Criteria

Eligibility was defined a priori using a PICOS-informed framework and operationalised through explicit inclusion and exclusion criteria (Table 1 and Table 2). Studies were eligible if they were peer-reviewed journal articles published in English between 2020 and 2025, reported empirical evidence on PE teachers' or pre-service teachers' competence, self-efficacy, attitudes, preparedness, training, or supporting innovations for inclusive or adapted physical education, and provided extractable data. Conference papers, editorials, book chapters, non-empirical commentaries, and studies tangential to the review focus were excluded.

**Table 1.** PICOS Framework Guiding Study Eligibility

Element	Description
Population	Physical education teachers and pre-service teachers (and teaching assistants) involved in inclusive or adapted physical education for learners with disabilities or special educational needs
Interest/Intervention	Teacher competence, self-efficacy, attitudes, knowledge, preparedness, training (initial teacher education and continuing professional development), and pedagogical or technological innovations for inclusive physical education
Comparison	Where reported (e.g., pre- vs. post-training, course vs. no course); a comparator was not required for inclusion
Outcomes	Teacher competence, self-efficacy, attitudes, knowledge, and preparedness; reported barriers and facilitators of inclusive practice
Study design	Empirical peer-reviewed studies (quantitative, qualitative, mixed-methods, or bibliometric)

**Table 2.** Inclusion and Exclusion Criteria

Criterion	Inclusion	Exclusion
<b>Language</b>	English only	Non-English publications
<b>Document type</b>	Peer-reviewed journal article	Conference paper, book chapter, editorial, review protocol
<b>Publication period</b>	2020–2025	Published before 2020
<b>Subject focus</b>	Teacher competence/preparedness for inclusive or adapted PE	Unrelated disciplines or tangential mention only
<b>Population</b>	PE teachers / pre-service PE teachers / teaching assistants	Non-PE populations or studies centred only on students
<b>Data</b>	Extractable empirical data	No extractable data / non-empirical commentary
<b>Accessibility</b>	Full text available	Full text inaccessible

### Study Selection Process

Study selection followed a sequential, multi-stage process consistent with PRISMA 2020. Records exported from Scopus were first de-duplicated. Remaining records were screened at the title and abstract level against the eligibility criteria, with clearly irrelevant records removed. Records passing this stage were retrieved in full text and assessed for eligibility, with reasons recorded for each exclusion. Studies meeting all criteria were retained for synthesis. Screening decisions were documented at each stage to ensure an auditable trail, and ambiguous cases were resolved through re-examination of the full text against the pre-specified criteria.

### Quality Assessment - FICO Framework

The methodological adequacy of eligible studies was appraised using the FICO framework, which evaluates each study against four dimensions: Focus (clarity of aims and relevance to the review question), Information (transparency and adequacy of methods and data), Context (appropriateness of setting, sample, and design), and Outcome (clarity and defensibility of reported findings). Each dimension was rated, and studies were required to demonstrate adequacy across all four dimensions to be retained. The FICO appraisal functioned as a minimum-quality threshold and as a structured lens for interpreting the relative strength of evidence during synthesis rather than as a basis for numerical weighting. Title-abstract and full-text screening were performed by two reviewers independently against the predefined PICOS criteria; agreement was Cohen's  $\kappa = 0.78$ .

### Data Extraction Procedure

A standardised extraction template was applied to each included study to ensure consistency. Extracted fields comprised author(s), publication year, country or region, study design and method, sample characteristics, the intervention, innovation, or focus examined, the outcome measures employed, and the principal findings. Extraction drew directly on the bibliographic records and study abstracts, and the extracted material populated the descriptive and thematic tables presented in the results. The structured template supported comparison across studies and underpinned the subsequent thematic synthesis.

### Network and Bibliometric Analysis Methodology

To complement the narrative synthesis, descriptive bibliometric procedures were applied to the included corpus. The temporal distribution of publications, the geographic distribution of study settings, and the distribution of studies across thematic clusters were tabulated and visualised. These descriptive analyses characterise the structure and recent trajectory of the field and contextualise the thematic findings; they were conducted on the included set to summarise its profile rather than to perform inferential co-citation or co-authorship mapping, which lay beyond the scope of the present review.

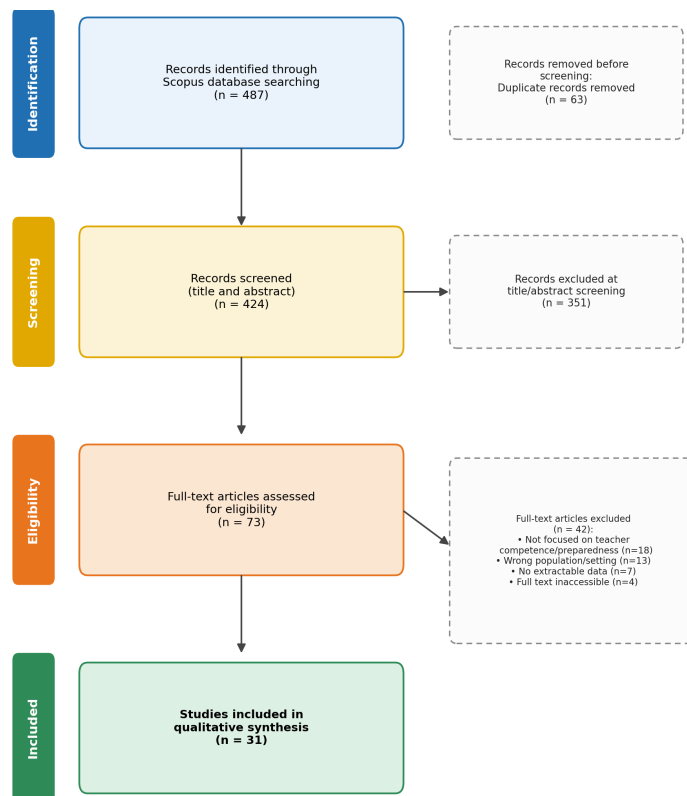
### Data Analysis and Synthesis

Findings were integrated using a thematic synthesis approach, which is appropriate for combining qualitative, quantitative, and mixed-methods evidence around shared analytic questions (Thomas & Harden, 2008; Braun & Clarke, 2006). Extracted findings were coded inductively, codes were organised into candidate themes, and themes were reviewed against the research questions and refined to ensure internal coherence and distinctiveness. Four analytic themes were constructed, corresponding to the four research questions: essential competencies and self-efficacy; barriers and facilitators; teacher education and professional development; and

pedagogical and technological innovation. Synthesis proceeded by comparing findings within and across themes to identify convergences, contradictions, and gaps.

### Reporting and Documentation

The review was conducted and reported in accordance with the PRISMA 2020 checklist to ensure transparency and reproducibility (Page et al., 2021). The flow of records through identification, screening, eligibility, and inclusion is documented in the PRISMA flow diagram (Figure 1), and the numerical results of the selection process are reported in full in the results. All bibliographic details, counts, and study characteristics were derived directly from the exported source records to preserve data integrity throughout the review.



**Figure 1.** PRISMA 2020 flow diagram of the study identification, screening, eligibility, and inclusion process.

## Results and Discussions

### Study Selection Results

The search of Scopus identified 487 records. After 63 duplicate records were removed, 424 records proceeded to title and abstract screening, at which stage 351 records were excluded for clear irrelevance to teacher competence or preparedness for inclusive physical education. The remaining 73 records were retrieved and assessed in full text against the eligibility criteria. Of these, 42 were excluded: 18 did not focus on teacher competence or preparedness, 13 involved the wrong population or setting, 7 provided no extractable empirical data, and 4 were inaccessible in full text. A final set of 31 studies met all criteria and were included in the qualitative synthesis. The complete flow of records is depicted in Figure 1, and the numbers reported here are consistent with the abstract, methods, and subsequent results.

### Descriptive Characteristics

The 31 included studies were published between 2020 and 2025, with a generally upward trajectory of output and a notable concentration in the most recent year, reflecting intensifying scholarly attention to inclusive-PE preparedness (Figure 2). The corpus was geographically diverse, spanning the Middle East, East Asia, Europe, North and South America, and multi-country collaborations, with Saudi Arabia, the United Kingdom, the United States, and South Korea contributing the largest shares (Figure 3). Methodologically, the studies combined quantitative survey and pre-post designs, qualitative interview and thematic studies, mixed-methods evaluations, and a bibliometric analysis, indicating a field that draws on a broad methodological repertoire. The thematic distribution of the corpus across the four research questions is summarised in Figure 4, while the full descriptive and classificatory details of each study are presented in Table 3 and Table 4.

**Table 3.** Summary of Included Studies (N = 31)

Title	Author(s)	Year	Country	Method	Key Findings
Combining adapted physical education with individualized education programs: Building Korean pre-service teachers' self-efficacy for inclusive physical education	Koh	2021	South Korea	Quantitative (longitudinal survey; quadratic growth-curve modeling)	Combining an adapted PE course with individualized education program training produced significantly greater and more sustained growth in pre-service teachers' inclusive-PE self-efficacy than either an APE course alone or no course.
Faculty Perspective Regarding Practical Experience of Adapted Physical Education for Undergraduate Students	Park	2023	United States	Qualitative (structured interviews; thematic analysis)	Faculty viewed practical, diverse APE practicum experiences as integral to professional preparation, but reported no uniform standards; quality, diversity of settings, and clear instructor guidance shaped learning.
Initial teacher education and continuing professional development: the perspectives of special school physical education teachers	Maher & Fitzgerald	2020	England (UK)	Qualitative (situated-learning interviews)	Special-needs content was marginalised in initial teacher education and CPD opportunities for special-school PE teachers were limited, signalling a need to rethink career-long inclusive-PE training.
Physical Education and Development of Locomotion and Gross Motor Skills of Children with Autism Spectrum Disorder	Kaplánová et al.	2023	Slovakia	Quantitative (quasi-experimental; TGMD-2)	Regular TGMD-2-based PE exercises improved locomotion and gross-motor performance in children with autism, whereas absence of structured movement led to significant motor deterioration.
Using an exergame in inclusive physical education for elementary school children with hearing impairment: A future area of research in Saudi Arabia	Alshahrany & Ibrahim	2021	Saudi Arabia	Conceptual/secondary-data review	Exergames are positioned as a promising, under-researched tool for developing fundamental motor skills in elementary children with hearing impairment within inclusive PE in Saudi Arabia.
Taking Steps to Inclusion: A Content Analysis of a Resource Aimed to Support Teachers in Delivering Inclusive Physical Education	Tristani et al.	2021	Canada	Qualitative (content analysis; TPB/TDF)	Content analysis of an inclusion resource showed it addressed several behaviour-change determinants but unevenly, indicating that support resources need theory-based design to effectively guide inclusive teaching.
Teachers' preparedness to deliver remote adapted physical education from different European perspectives: Updates to the European Standards in Adapted Physical Activity	Ng et al.	2021	Multi-country (Europe)	Mixed (consensus exercise + survey)	European APE standards were updated with 13 new technology-related competencies; teachers' readiness for remote APE varied with technological content knowledge, with most functions deemed

Title	Author(s)	Year	Country	Method	Key Findings
Wheelchair hockey and inclusion: An emotional and relational analysis in lower secondary school	Tafari et al.	2025	Italy	Mixed-methods (experimental + qualitative; SDQ)	feasible but some needing extra resources. Wheelchair hockey enhanced social-emotional skills and relational climate, confirming the value of structured inclusive-PE activities for fostering equity and participation in mainstream classes.
Associations Between Technology Use, Knowledge and Inclusive Physical Education Teacher-Efficacy Among European Primary School Teachers	Ng et al.	2025	Multi-country (Northern Europe)	Quantitative (survey; mediation analysis)	Technological-pedagogical content knowledge mediated links between technology use and inclusive-PE teacher efficacy, underscoring that building pedagogical competence (not technology alone) drives inclusive capacity. A German LIRSPE was produced through transcultural validation; conceptual differences around paraeducators and gym management highlighted that teachers often feel unprepared and need reliable inclusion-assessment tools.
Cross-Cultural Translation and Application of the Lieberman–Brian Inclusion Rating Scale for PE in German-Speaking Countries	Giese et al.	2022	Germany (German-speaking)	Qualitative (cross-cultural translation/validation)	CPD tutors held varied, sometimes narrow conceptions of inclusion, showing that CPD providers strongly shape- and can constrain-how inclusive pedagogy is understood and enacted.
What sort of ‘inclusion’ is Continuing Professional Development promoting? An investigation of a national CPD programme for inclusive physical education	Makopoulou et al.	2022	England (UK)	Qualitative (observations, interviews, questionnaire)	An online course raised pre-service teachers’ self-efficacy and attitudes, with gains differing by disability type and activity context and predicted by participants’ starting levels. Maker-based PE expanded participation for sport-marginalised students and shifted teachers toward reflective, practice-based instruction, offering a low-cost adaptable model for inclusive curriculum reform.
Online training on inclusive physical education: differences in self-efficacy and attitudes of pre-service PE teachers across disability and activity	Hutzler et al.	2024	Israel	Quantitative (pre-post online survey)	APE teachers used social media for informal professional learning, yet rated conferences as significantly more useful, indicating social media complements rather than replaces formal development.
Expanding Participation in Inclusive Physical Education: A Maker-Based Approach for Sport-Marginalized Students	Kwon et al.	2025	South Korea	Qualitative (design-based; professional learning community)	
Adapted Physical Educators’ Social Media Usage for Professional Learning	McNamara et al.	2022	United States	Quantitative (survey; regression)	

Title	Author(s)	Year	Country	Method	Key Findings
The experiences and understandings of the K-13 curriculum implementation of Indonesian teachers of adapted physical education (APE)	Burhaein et al.	2020	Indonesia	Qualitative (phenomenology)	APE teachers experienced the K-13 curriculum as demanding, with implementation challenges around preparation and assessment underscoring the need for stronger preparatory support. Teachers judged their inclusion training as not yet adjusted to the inclusive-school paradigm, calling for specific long-term curricular units and supervised practice in diverse real contexts.
Physical Education Teachers' Representations of Their Training to Promote the Inclusion of Students with Disabilities	Celestino et al.	2024	Portugal	Qualitative (interviews)	Teachers' personal and family medical histories significantly affected their sense of pedagogical competence and knowledge, which were positively correlated, linking educator health experience to inclusive capability.
Defining the Effect of Teachers' Medical History on their Inclusive Teaching Practice: Analyzing Feelings of Competence and Knowledge in Inclusive Physical Education	Ben Rakaa et al.	2024a	Morocco	Quantitative (questionnaire; n=339)	Prior experience of observing a PE teacher work with a disabled student significantly predicted pre-service teachers' self-efficacy, highlighting role-modelling as a key efficacy source. A requirement-situation, casework-based PETE seminar was highly effective in developing pre-service teachers' situation-specific skills for recognition, individual support, and participation in inclusive PE.
Self-efficacy of pre-service physical education teachers toward inclusion in Saudi Arabia	Alhumaid et al.	2020	Saudi Arabia	Quantitative (survey; repeated-measures MANCOVA)	Research on PE practicums grew markedly since 2010 across three thematic clusters, led by the US, Brazil and Spain, but with low author collaboration, signalling a fragmented field.
Qualification of prospective PE teachers for inclusive PE: development and evaluation of a PETE concept	Erhorn et al.	2025	Germany	Mixed (design & evaluation; video-based casework)	Most educators included children with functional limitations alongside peers, yet about 39% felt uninformed and ill-equipped, identifying training and knowledge gaps as central barriers. APE provision across BRICS lacked comprehensive guidelines on teaching strategies, curriculum, assessment and professional
Global research trends on physical education practices: a bibliometric analysis and science-mapping study	Hernández-González et al.	2025	Spain (global dataset)	Bibliometric / science-mapping (n=83)	
Identifying Facilitators and Barriers in Quebec Schools to Promote Inclusive Physical Education	Hebinck et al.	2023	Canada (Quebec)	Quantitative (cross-sectional survey)	
Bridging policy and practice: Adapted physical education for special needs learners in BRICS	Engelbrecht et al.	2025	BRICS (multi-country)	Qualitative (document analysis)	

Title	Author(s)	Year	Country	Method	Key Findings
An investigation into the effects of short-course professional development on teachers' and teaching assistants' self-efficacy	Makopoulou et al.	2021	England (UK)	Quantitative (repeated-measures; n>1500)	development, exposing a persistent policy-to-practice gap. Short-course CPD improved teachers' and assistants' inclusive-PE self-efficacy, but effectiveness depended on individual factors and perceived quality, requiring greater tailoring of delivery.
The impact of a summer sports camp for children with visual impairments on the self-efficacy of physical education pre-service teachers: A pilot study	Foley et al.	2020	United States	Quantitative (pre-post pilot)	A one-week disability-oriented sports camp significantly increased pre-service teachers' self-efficacy toward including students with intellectual, physical and visual disabilities.
Physical education teachers' self-efficacy toward including students with autism in Saudi Arabia	Alhumaid	2021	Saudi Arabia	Quantitative (survey; n=214)	Teacher age and feelings of preparedness significantly predicted self-efficacy toward including students with autism, reinforcing preparedness as a malleable lever for inclusive capacity.
Effect of an Inclusive Physical Education (IPE) Training Workshop on Trainee Teachers' Self-Efficacy	Neville et al.	2020	Ireland	Quantitative (pre-post; mixed modeling; n=366)	Inclusive-PE workshops raised trainee teachers' self-efficacy, moderated by trainees' baseline levels, specialization and school placement, supporting embedding IPE within teacher training.
The Influence of School Pathologies on the Feeling of Pedagogical Incompetence in Teaching Inclusive Physical Education	Ben Rakaa et al.	2024b	Morocco	Quantitative (questionnaire)	Non-participation patterns and school pathologies shaped teachers' sense of pedagogical (in)competence, which strongly influenced inclusion outcomes for students with disabilities.
The Impact of a Rater Training Program on the TGMD-3 Scoring Accuracy of Pre-Service Adapted Physical Education Teachers	Kwon & Maeng	2022	South Korea	Quantitative (experimental; rater training)	A TGMD-3 rater-training program significantly improved pre-service APE teachers' accuracy in scoring fundamental motor skills of children with developmental disabilities.
Predictors of Physical Educators' Attitudes toward including Students with Disabilities in Inclusive Classes	Alhumaid	2022	Saudi Arabia	Quantitative (survey; SACIE-R; N=1303)	Gender, prior disability-teaching training, and knowledge of inclusion legislation significantly predicted physical educators' attitudes toward including students with disabilities.
A thematic analysis of teachers' experience in inclusive physical education teaching	Suryobroto et al.	2022	Indonesia	Qualitative (thematic analysis; photo-elicitation)	Accumulated teaching experience was central to developing pedagogical knowledge and managing challenges, with inclusive

Title	Author(s)	Year	Country	Method	Key Findings
Prospects of drone racing implementation in inclusive physical education and sports environment of higher education institution: analysis of students 'and teachers' opinions	DI et al.	2025	Russia	Mixed (survey of student/teacher opinions)	PE experienced as a deeply relational, caring practice. Students and teachers viewed drone racing as a promising technological activity for inclusive higher-education PE, supporting development of digital-generation-oriented inclusive sport programs.

Table 4. Classification of Included Studies by Theme and Method

Author(s)	Year	Country	Research Design	Theme/Focus	Technology/Intervention	Outcome
Koh	2021	South Korea	Quantitative	Training & Professional Development	Combined APE + IEP course	Self-efficacy
Park	2023	United States	Qualitative	Training & Professional Development	APE practicum/field experience	Professional preparation
Maher & Fitzgerald	2020	England (UK)	Qualitative	Barriers & Facilitators Pedagogical & Technological	ITE and CPD provision	Preparedness
Kaplánová et al.	2023	Slovakia	Quantitative	Innovation Pedagogical & Technological	TGMD-2 movement intervention	Motor development (students)
Alshahrany & Ibrahim	2021	Saudi Arabia	Conceptual/secondary-data review	Innovation Pedagogical & Technological	Exergame	Motor-skill development
Tristani et al.	2021	Canada	Qualitative	Innovation Pedagogical & Technological	Inclusion teaching resource	Teacher support
Ng et al.	2021	Multi-country (Europe)	Mixed	Innovation Pedagogical & Technological	Remote/technology-supported APE; EUSAPA	Preparedness
Tafari et al.	2025	Italy	Mixed-methods	Innovation Pedagogical & Technological	Wheelchair hockey	Social-emotional inclusion
Ng et al.	2025	Multi-country (Northern Europe) Germany	Quantitative	Innovation Pedagogical & Technological	Technology for PE; TPACK-21-PE	Teacher-efficacy
Giese et al.	2022	Germany (German-speaking)	Qualitative	Competence, Self-Efficacy & Attitudes	Lieberman–Brian Inclusion Rating Scale	Inclusive-practice assessment
Makopoulou et al.	2022	England (UK)	Qualitative	Training & Professional Development	National CPD programme	Conceptions of inclusion

Author(s)	Year	Country	Research Design	Theme/Focus	Technology/Intervention	Outcome
Hutzler et al.	2024	Israel	Quantitative	Competence, Self-Efficacy & Attitudes	Online inclusive-PE course	Self-efficacy & attitudes
Kwon et al.	2025	South Korea	Qualitative	Pedagogical & Technological Innovation Training & Professional Development	Maker-based PE	Participation & teacher identity
McNamar a et al.	2022	United States	Quantitative	Barriers & Facilitators Training & Professional Development	Social media for professional learning	Informal learning
Burhaein et al.	2020	Indonesia	Qualitative	Barriers & Facilitators Training & Professional Development	K-13 curriculum	Curriculum implementation
Celestino et al.	2024	Portugal	Qualitative	Competence, Self-Efficacy & Attitudes	Initial teacher training	Training adequacy
Ben Rakaa et al.	2024	Morocco	Quantitative	Competence, Self-Efficacy & Attitudes	-	Competence & knowledge
Alhumaid et al.	2020	Saudi Arabia	Quantitative	Competence, Self-Efficacy & Attitudes	-	Self-efficacy
Erhorn et al.	2025	Germany	Mixed	Training & Professional Development	Requirement-situation PETE concept	Situation-specific skills
Hernández-González et al.	2025	Spain (global dataset)	Bibliometric / science-mapping	Training & Professional Development	-	Research trends
Hebinck et al.	2023	Canada (Quebec)	Quantitative	Barriers & Facilitators	-	Facilitators & barriers
Engelbrecht et al.	2025	BRICS (multi-country)	Qualitative	Barriers & Facilitators	-	Policy–practice gap
Makopoulou et al.	2021	England (UK)	Quantitative	Training & Professional Development	Short-course CPD	Self-efficacy
Foley et al.	2020	United States	Quantitative	Competence, Self-Efficacy & Attitudes	Summer sports camp (visual impairment)	Self-efficacy
Alhumaid	2021	Saudi Arabia	Quantitative	Competence, Self-Efficacy & Attitudes	-	Self-efficacy (autism)
Neville et al.	2020	Ireland	Quantitative	Training & Professional Development	IPE training workshop	Self-efficacy
Ben Rakaa et al.	2024	Morocco	Quantitative	Barriers & Facilitators Training & Professional Development	-	Pedagogical competence
Kwon & Maeng	2022	South Korea	Quantitative	Barriers & Facilitators Training & Professional Development	TGMD-3 rater training	Assessment accuracy

Author(s)	Year	Country	Research Design	Theme/Focus	Technology/Intervention	Outcome
Alhumaid	2022	Saudi Arabia	Quantitative	Competence, Self-Efficacy & Attitudes	-	Attitudes
Suryobroto et al.	2022	Indonesia	Qualitative	Barriers & Facilitators Pedagogical & Technological Innovation	-	Teaching experience
DI et al.	2025	Russia	Mixed	Technological Innovation	Drone racing	Engagement/innovation

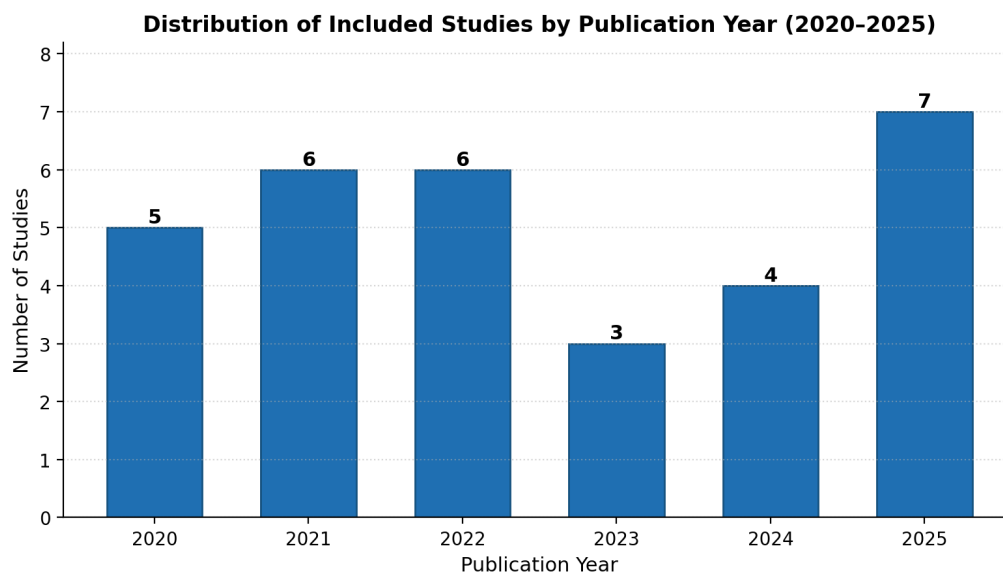


Figure 2. Distribution of included studies by publication year (2020–2025).

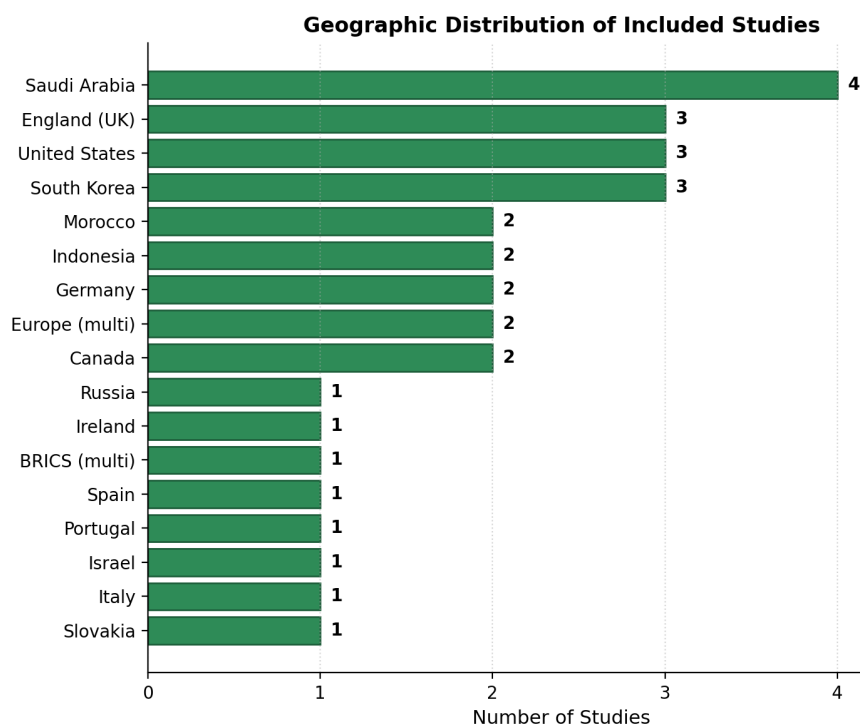
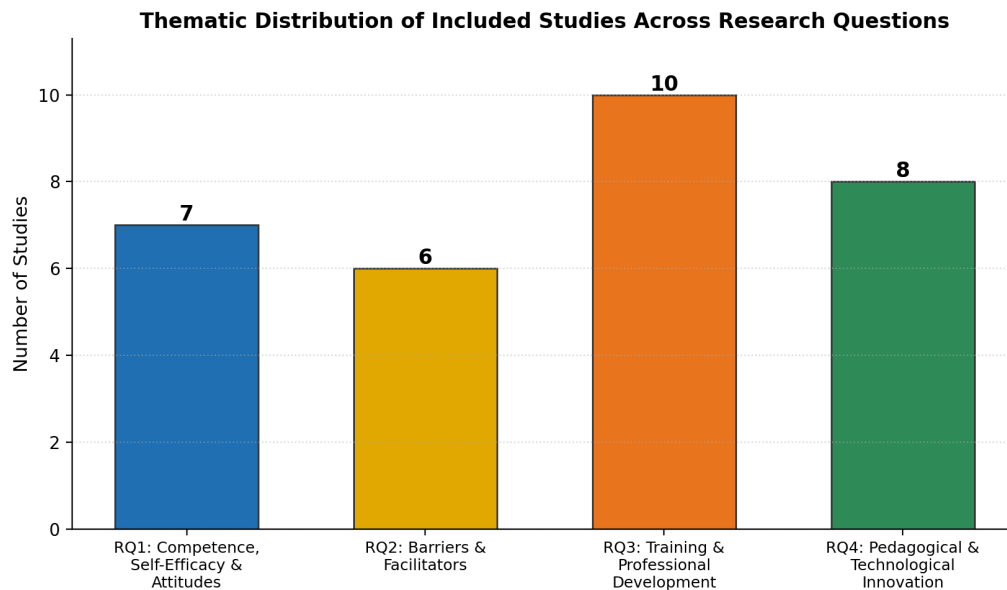


Figure 3. Geographic distribution of the included studies by country or region.



**Figure 4.** Thematic distribution of included studies across the four research questions.

### Thematic Synthesis

#### Essential Competencies and Preparedness Factors (RQ1)

Evidence addressing the first research question leads to a multidimensional view of competence where self-efficacy, knowledge, and attitudes work together. Among various samples from different countries, self-efficacy surfaced as the most often studied aspect and the one most consistently associated with inclusive intentions and behavior. Both pre- and in-service teachers' research has revealed that efficacy beliefs about including students with intellectual, physical, sensory, and autism-related needs differ systematically and can be changed, with the experience of witnessing a skilled inclusive teacher being a particularly powerful source (Alhumaid et al., 2020; Alhumaid, 2021; Foley et al., 2020). In other words, these results do not see self-efficacy as a permanent attribute but as a changeable element of competence that is influenced by the planned experience.

Besides confidence, the analyzed studies according to us highlight that knowledge and attitudes as elements of competence. Attitudinal studies have revealed that physical educators' willingness to adopt inclusion is based on factors like previous training in disability teaching and knowledge of inclusion laws, indicating that competence is a combination of professional knowledge and understanding of policies rather than just psychological readiness (Alhumaid, 2022; Hutzler et al., 2024). The adaptation and validation of a scale for rating inclusion in the German-speaking areas gave extra support to the idea that teachers quite often feel that they have to face a new situation, that there is a need for reliable instruments to make inclusive practice visible and measurable (Giese et al., 2022). Altogether these studies show that competence should be seen as the combination of efficacy, knowledge, and attitude.

A more recent strand extends the competence construct to encompass personal and contextual influences that have received limited prior attention. Evidence that teachers' own medical histories shape their sense of pedagogical competence and knowledge suggests that lived experience contributes to inclusive capability in ways not captured by conventional training metrics (Ben Rakaa et al., 2024a). Taken as a whole, the evidence for the first research question delineates a competence profile that is multidimensional, context-sensitive, and developable, while also revealing that studies have tended to isolate single components rather than model their interaction, leaving the integrated structure of inclusive-PE competence only partially specified.

#### Barriers and Facilitators of Readiness (RQ2)

Studies responsive to the second research question, without exception, acknowledge insufficient professional training and scarcity of institutional support as the major impediments to obtaining readiness for inclusive-physical education (PE). Thus, research in special as well as mainstream provision found that inclusive-element in initial teacher education is occasionally sidelined and professional development that is continually capable of updating teachers is inadequate, hence teachers are left to manage inclusion without much formal training (Maher & Fitzgerald, 2020). Furthermore, the survey data acted as a support to this trend by indicating that even in places where inclusion of children with handicaps has become regular, a significant percentage of teachers consider themselves ill-informed and ill-prepared to bring it about (Hebinck et al., 2023). These narratives

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diffused a unified message that gaps in preparation are in fact inherent or characterizing features of the systems where teachers find themselves.

Contextual and policy-level barriers exacerbate these preparation deficits. Analysis of official documents in several countries highlighted that there are no comprehensive guidelines on teaching strategies, curriculum, assessment, and professional development of adapted physical education, which shows a glaring discrepancy between inclusive policy and teacher practice (Engelbrecht et al., 2025). At the same time, curriculum-implementation research noted that the introduction of inclusive curricula was constantly burdening teachers with new work without providing them with enough preparatory support. Hence, difficulties in planning and assessment arose (Burhaein et al., 2020). The repetition of this discovery in different countries suggests that barriers operate not only at the level of individual preparation but also the school resourcing and system-level policy.

On the other hand, research papers that were analyzed have, apart from identifying facilitators, also even potential barriers for the implementation of inclusive education. Most facilitators that have been identified are accumulated teaching experience and supportive relational conditions. Thematic analyses of teachers' lived experience revealed that experience is the core to building the pedagogical knowledge and adaptive strategies needed for inclusion, also that inclusive PE is implemented as a deeply relational, caring practice (Suryobroto et al., 2022). There are also pieces of evidence showing that teachers' perceptions of their own pedagogical competence significantly determine inclusion outcomes, thereby connecting the facilitating factor of confidence to the barrier of insufficient training (Ben Rakaa et al., 2024b). The synthesis for the second research question, therefore, depicts readiness as the result of a continual interaction among the structural limitations, and experiential and relational resources.

### **Teacher Education and Professional Development (RQ3)**

The third research question asks about the impacts of pre-service teacher training as well as teacher professional development over time and a body of evidence indicates that a well-planned training can significantly increase one's competence and self-efficacy. Based on intervention studies, it has been found that conducting workshops and courses can increase self-efficacy of trainee and in-service teachers in inclusive-P.E., and importantly, a synergistic effect of the adapted physical education coursework and individualized education program training led to a sustained increase in efficacy (Koh, 2021; Neville et al., 2020). Evaluating on a large scale the short-course professional development, it was found that it had resulted in self-efficacy improvements but also warned that effects rely on the participant's initial level and their perception of the course quality (Makopoulou et al., 2021). Therefore, these outcomes not only qualify training as a dependable tool but also indicate its effect is conditional and not the same for everyone.

Preparation quality and design stand out as pivotal factors throughout this body of work. Qualitative and design-based studies revealed that authentic, practice-embedded learning, supervised practica, and casework based on typical inclusive-PE scenarios are very effective for the development of situation-specific skills, while training that leaves these skills abstract or fragmented shows lesser results (Park, 2023; Erhorn et al., 2025; Celestino et al., 2024). Investigations into professional learning revealed that CPD providers themselves have different understandings of inclusion, which can limit what teachers learn, and that informal means such as social media can complement but not replace formal development (Makopoulou et al., 2022; McNamara et al., 2022). Indeed, specially-constructed rater-training has further enhanced the reliability with which pre-service teachers judge motor skills, demonstrating that precise training is capable of refining particular professional competences (Kwon et al., 2022).

From the standpoint of the broader disciplinary area, bibliometric analysis positions these intervention results in a research domain which has been expanding since 2010 but is still fragmented, weakly collaborative and mainly organised around a few thematic clusters and dominated by certain national systems (Hernández-González et al., 2025). Such a structural profile is quite instrumental in revealing the reasons why training impacts, although always positively changing, almost cannot be compared from one study to another: variety in designs, measures and contexts very much prevent cumulative inference. Thus, the summary for the third research question indicates that teacher education and professional development remain effective but dependent on quality, and the field would gain from more standardisation and collaboration in order to consolidate the knowledge of which training characteristics most reliably foster inclusive-PE preparedness.

### **Pedagogical and Technological Innovation (RQ4)**

Based on evidence that tackles the fourth research question, pedagogical and technological upgrades are helping schools deliver inclusive Physical Education (PE) through new means. Similarly, the notion of teacher competence is also changing. Teachers' enthusiasm to employ technology-supported and remote adapted PE methods closely tied to their technological-pedagogical content knowledge. Simultaneously, the competencies

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required of inclusive practitioners are expanding to encompass digital pedagogy (Ng et al., 2021; Ng et al., 2025). Typically, activeness designs, among them maker-based PE and inclusive sports like wheelchair hockey, not only bring in more marginalised learners but also trigger teachers' changes in their views of inclusion and in their professional identity (Kwon et al., 2025; Tafuri et al., 2025). These results imply that innovation could be a dual factor in increasing student participation and in the professional growth of teachers.

Another set of innovation studies explored the use of specific tools and methods to develop particular inclusive teaching skills. Examples include the use of structured movement programs to enhance motor skills in children with autism, the promotion of exergames as a vehicle to teach fundamental motor skills to students with hearing impairments, and the positive reception of drone racing as a digitally oriented, inclusive, and engaging activity (Kaplánová et al., 2023; Alshahrany & Ibrahim, 2021; Dl et al., 2025). An analysis of content from a resource for inclusion support revealed that although such materials can potentially address several behaviors change determinants, they should be grounded in a theoretical framework to effectively guide teaching efforts (Tristani et al., 2021). Together, these research papers reveal the wide-ranging nature of innovation but also the fact that it is quite unbalanced, with some methods being thoroughly evaluated and others being merely presented as promising avenues that need further evidence.

The major theme that runs through the innovation papers is the strong warning that simply introducing new tools and activities will not necessarily result in teachers being well prepared over the long-term. Several of the studies that have been reviewed highlighted that it is pedagogical skill, and not the technology itself, that is the key factor in students with disabilities benefiting from innovations, and that significant training is still required to enable the proficient integration of new methodologies (Ng et al., 2025; Tafuri et al., 2025). Thus, the overall review of the literature relating to the fourth research question holds that pedagogical and technological innovations can be considered as real, though dependent, factors in inclusive capacity, capable of bringing value when they are part of competent, well-supported teaching, and of doubtful merit when they are implemented apart from the development of teachers.

### **Comparative and Critical Analysis**

Their comparative study of methodological approaches across the corpus exposes a field greatly reliant on cross-section surveys and short pre-post designs, but a large qualitative tradition of interviews and thematic studies and only a small set of mixed-methods and design-based evaluations are also present. Certain quantitative works were very common in the research of self-efficacy and attitudes because comparative studies were possible thanks to validated scales, but qualitative work that investigated barriers, experience, and quality of training were dominant as qualitative work gets to the contextual nuance in a study very well. This division of methodological labour has produced complementary insights, but hardly any designs are capable of laying out competence development over time or that are able to link teacher preparedness to both observed practice and student outcomes.

However, the use of self-report methods as well as single-site and single-system samples greatly limit the strength of the inference in the field. Longitudinal and experimental designs are still quite uncommon, and the variety of competence measures makes it difficult to synthesize, a limitation which is also reflected by the bibliometric evidence of fragmentation and low levels of collaboration. Throughout the years, the corpus reveals a steady evolution from descriptive studies of efficacy and attitudes to more design-oriented and technology-focused investigations, marking the progression of methodologies. On the other hand, the comparative analysis reveals that the next breakthrough in the field relies less on another cross-sectional confirmation of malleable self-efficacy and more on standardized measurement, longitudinal tracking, and studies that link preparation to actual practice in inclusive classrooms.

### **Discussion**

As a single piece, the compiled research shows that teacher competence and readiness for inclusive physical education (PE) are best seen as a capacity that can be developed and is multidimensional, by the way psychological, knowledge-based, experiential, and contextual factors interact. One of the recurring results is that self-efficacy is influenced by the designed experience, which, combined with the other recurring result that lack of adequate preparation still remains a structural barrier, positions inclusive-PE readiness as both capable of being improved and historically neglected. This is the core message from the review: there is quite a bit of evidence on how to develop inclusive competence; however, the systems responsible for preparation usually fail to offer these at enough scale or quality.

On the one hand, these results develop and enrich dominant self-efficacy explanations of inclusive teaching. The research shows that efficacy beliefs are very important and that mastery and vicarious experiences explain a lot. On the other hand, while efficacy remains an important explanation, it is not enough to fully explain competence. The latter is also based on knowledge, attitudes, situation-specific judgement, and even

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teachers' personal histories. So, the data back up a theoretical model of self-efficacy being just one component of a broader competence framework and also give reason to support the use of situated and experiential professional learning concepts that highlight real practice and contextual awareness (Erhorn et al., 2020; Makopoulou, 2018).

The report can be used as a source of concrete and practical information for teacher educators, professional-development providers, and policymakers. The most effective method of preparation includes the following features. It is ongoing, it is built upon real practice, it is mindful of the entry level of the trainees, and it is backed up by accurate assessment tools and logically structured policy frameworks. This means practitioners and program designers have to put supervised practica, disabilities-related experiential learning, and contextually customized continuous professional development ahead of short, decontextualized exposure. Meanwhile, validated instruments and cross-cultural measures help to visualize and track inclusive competence (Selickaité et al., 2019; Langer et al., 2022; Lourenço et al., 2025).

The analysis conducted within the context of previous reviews and bibliometric studies not only verifies but also builds on the existing literature. The initial exploration of the subject area depicted the development, disentanglement, and poor partnership, and this latest review supports these structural characteristics of the field while performing thematic integration around the four major themes of competence, barriers, training, and innovation that isolated-construct reviews have not been capable of (Hernández-González et al., 2025; Muñoz-Hinrichsen et al., 2025). As a result, it situates the inclusive-PE preparedness literature in the wider inclusive-education reform context and makes more explicit than previous works the link of its psychological, pedagogical, and policy elements.

Secondly, it highlights some hard inconsistencies and disputes in the literature. Different studies have different results about the longevity of the effects of short-course training, the value of official versus unofficial professional learning, and whether technological innovation can be a dependable factor in inclusive teaching or is only a supplement (Grassi-Roig et al., 2022; McNamara et al., 2022). Differences in quality of instruction, evaluation, participant characteristics, and country of origin could very well explain these inconsistencies which emphasize that the outcomes depend on the situation. Instead of indicating a lack of coherence, they describe under which conditions preparation and innovation can be effective.

There are at least three areas of research that emerge from the synthesis. First, there are very few longitudinal and experimental studies in the field that can determine the longevity and the causal structure of competence development. Second, the wide variety and the scattered cross-cultural validation of competence measurement greatly hamper the cumulative synthesis and the comparison. Third, the evidence is unevenly spread across the globe, with only a few systems being extensively represented and many others almost entirely absent, thus greatly limiting the generalisability of the findings (Borges Barbosa et al., 2023; da Silva Filho et al., 2025; Paz et al., 2023; Picardo et al., 2025a; Picardo et al., 2025b). Closing these gaps is an absolute must if we want to transition from a mere descriptive evidence base to one that is predictive and prescriptive.

This review itself is limited by at least three factors. It relied solely on one database, Scopus, which although extensive, might have missed relevant studies from other databases or grey literature. The review also only included peer-reviewed articles in English, which could have caused language and publication bias. Lastly, the review being a qualitative synthesis of mainly self-report evidence, inherits the limitations in measurement and design of the individual studies, and did not carry out a quantitative meta-analysis. These limitations should be considered while framing the conclusions and interpreting the summarized results.

From the perspective of future work, the review offers at least three tangible recommendations. Researchers must do longitudinal and, if at all possible, experimental studies, which follow inclusive-PE competence from training to actual work and associate it with student participation and outcomes (del Rosario Martínez-Aguilera, 2022; Pawlowski & Souza, 2019). Methodologists should produce and adapt competence measures across cultures that capture efficacy, knowledge, attitudes, and situated judgement altogether. The sector should increase investigation in overlooked regions and enhance collaborative networks to pool evidence (Reina et al., 2016). To the research questions, the review shows that inclusive-PE competence consists of integrated efficacy, knowledge, attitudes, and situated skill (RQ1); that readiness is limited by structural preparation and policy gaps but boosted by experience and support (RQ2); that initial teacher education and ongoing professional development enhance competence when they are long-term, genuine, and quality-checked (RQ3); and that educational and technological innovations are valuable contributors but only when they are part of competent, well-supported teaching (RQ4).

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## Conclusions

This systematic review merged findings from 31 empirical studies to pinpoint the factors that influence physical education teachers' competence and readiness for inclusive practice. Regarding the first research question, the evidence suggests that teacher self-efficacy, content and pedagogical knowledge, situation-specific decision-making, and inclusive attitudes are the main components of competence, with practical, disability-oriented experience being the strongest source of these components as per the evidence. Second, continuous barriers, rarely inclusive content in training, limited resources, policy-to-practice mismatch, and teachers' feelings of being under-equipped, dominate the literature, while accumulated experience, supportive school conditions, and role-modelling are major facilitators. Third, initial teacher education and continuing professional development can significantly increase competence and self-efficacy, but their results depend on quality, duration, real-life practice, and attention to participants' starting points rather than on attendance alone. Fourth, technological and pedagogical innovations have the potential to increase participation and support inclusive pedagogy, but there is still a lack of evidence for their role in durable teacher preparedness. The primary role of this review is to present a combined, cross-contextual framework that unites these four aspects into a single synthesis. Its practical aspects highlight long-term, practice-embedded, and contextually tailored preparation to be the most reliable means to build inclusive capacity. It is constrained by its single database search, dependence on self-report data, and inconsistent geographical coverage, and it therefore recommends longitudinal studies, use of standard competence measures, and more research in under-represented regions. Because the corpus is dominated by self-report and single-context designs, the synthesis supports transferable patterns rather than pooled causal estimates; conclusions should be read as direction-of-effect evidence. Future standardized competence instruments should demonstrate cross-cultural structural validity and acceptable reliability to enable cumulative comparison.

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## References

- Alhumaid, M.M. (2021). Physical Education Teachers' Self-Efficacy Toward Including Students With Autism In Saudi Arabia. *International Journal Of Environmental Research And Public Health*, 18(24), Article 13197. <https://doi.org/10.3390/ijerph182413197>
- Alhumaid, M.M. (2022). Predictors Of Physical Educators' Attitudes Toward Including Students With Disabilities In Inclusive Classes. *Open Sports Sciences Journal*, 15(1), Article E1875399x2210260. <https://doi.org/10.2174/1875399x-v15-e221031-2022-34>
- Alhumaid, M.M., Khoo, S., & Bastos, T. (2020). Self-Efficacy Of Pre-Service Physical Education Teachers Toward Inclusion In Saudi Arabia. *Sustainability (Switzerland)*, 12(9), Article 3898. <https://doi.org/10.3390/Su12093898>
- Alshahrany, A.N., & Ibrahim, H.B. (2021). Using An Exergame In Inclusive Physical Education For Elementary School Children With Hearing Impairment: A Future Area Of Research In Saudi Arabia. *Estudios De Economia Aplicada*, 39(10). <https://doi.org/10.25115/Eea.V39i10.5808>
- Ben Rakaa, O., Bassiri, M., & Lotfi, S. (2024a). Defining The Effect Of Teachers' Medical History On Their Inclusive Teaching Practice: Analyzing Feelings Of Competence And Knowledge In Inclusive Physical Education. *Physical Education Theory And Methodology*, 24(5), 777–783. <https://doi.org/10.17309/Tmfv.2024.5.13>
- Ben Rakaa, O., Bassiri, M., & Lotfi, S. (2024b). The Influence Of School Pathologies On The Feeling Of Pedagogical Incompetence In Teaching Inclusive Physical Education. *Physical Education Theory And Methodology*, 24(4), 626–634. <https://doi.org/10.17309/Tmfv.2024.4.15>
- Borges Barbosa, M.L., De Almeida Pimenta, R., Rio Martins, R.L.D., Lebeis Pires, V.N., & De Almeida, V.A.R. (2023). Análise Da Percepção De Estagiários De Educação Física Sobre A Inclusão Na Escola: Uma Revisão Integrativa. \*\*, 29, Article E29046. <https://doi.org/10.22456/1982-8918.130615>
- Braun, V., & Clarke, V. (2006). Using Thematic Analysis In Psychology. *Qualitative Research In Psychology*, 3(2), 77–101. <https://doi.org/10.1191/1478088706qp063oa>
- Burhaein, E., Tarigan, B., & Phytanza, D.T.P. (2020). The Experiences And Understandings Of The K-13 Curriculum Implementation Of Indonesian Teachers Of Adapted Physical Education (Ape). *International Sports Studies*, 42, 29–42. <https://doi.org/10.30819/Iss.42-E.04>

- Celestino, T., Ribeiro, E., Morgado, E.G., Leonido, L., & Pereira, A. (2024). Physical Education Teachers' Representations Of Their Training To Promote The Inclusion Of Students With Disabilities. *Education Sciences*, 14(1), Article 49. <https://doi.org/10.3390/educsci14010049>
- Da Silva Filho, A.S., Da Silva, S.L., & Corrêa, U.C. (2025). Characterization Of Continuing Education Of Physical Education Professionals In The State Of São Paulo. *\*\**, 31, Article E31035. <https://doi.org/10.22456/1982-8918.141419>
- Del Rosario Martínez-Aguilera, G. (2022). Multiple Intelligences In Physical Education Class; A Formative Experience In Primary School Students. *\*\**, 45, 774–782. <https://doi.org/10.47197/Retos.V44i0.89393>
- DI, A.A., DI, Y.A., GI, G.B., & NI, M.V. (2025). Prospects Of Drone Racing Implementation In Inclusive Physical Education And Sports Environment Of Higher Education Institution: Analysis Of Students 'And Teachers' Opinions. *Perspektiv Nauki I Obrazovania*, 2025(4), 302–321. <https://doi.org/10.32744/Pse.2025.4.19>
- Engelbrecht, C., Du Toit, D., Van Der Merwe, N., & Kemp, C. (2025). Bridging Policy And Practice: Adapted Physical Education For Special Needs Learners In Brics. *African Journal Of Disability*, 14, Article A1626. <https://doi.org/10.4102/Ajod.V14i0.1626>
- Erhorn, J., Moeller, L., & Langer, W. (2020). Academic Physical Education Training For Inclusive Physical Education?: A Critical Review Of The State Of Research. *\*\**, 50(4), 487–500. <https://doi.org/10.1007/S12662-020-00668-5>
- Erhorn, J., Wirszing, D., & Langer, W. (2025). Qualification Of Prospective Pe Teachers For Inclusive Pe: Development And Evaluation Of A Pete Concept. *Physical Education And Sport Pedagogy*, 30(2), 136–153. <https://doi.org/10.1080/17408989.2023.2194901>
- Foley, J.T., Santarossa, S., Tindall, D.W., & Lieberman, L.J. (2020). The Impact Of A Summer Sports Camp For Children With Visual Impairments On The Self-Efficacy Of Physical Education Pre-Service Teachers: A Pilot Study. *European Journal Of Adapted Physical Activity*, 13(1), Article 3. <https://doi.org/10.5507/Euj.2019.011>
- Giese, M., Grenier, M., Lieberman, L.J., & Meier, S. (2022). Cross-Cultural Translation And Application Of The Lieberman–Brian Inclusion Rating Scale For Pe In German-Speaking Countries. *International Journal Of Environmental Research And Public Health*, 19(13), Article 7891. <https://doi.org/10.3390/Ijerp19137891>
- Grassi-Roig, M., Pérez-Tejero, J., & Coterón, J. (2022). Effects Of An Inclusive Physical Education Workshop On Teachers' Self-Efficacy. *\*\**, 17(51), 5–13. <https://doi.org/10.12800/Ccd.V17i51.1649>
- Hebinck, M., Boisvert, M., Labbé, M., Périnet-Lacroix, R., Brisebois, J., Best, K.L., & Robert, M.T. (2023). Identifying Facilitators And Barriers In Quebec Schools To Promote Inclusive Physical Education. *Disabilities*, 3(4), 608–620. <https://doi.org/10.3390/Disabilities3040039>
- Hernández-González, V., Carné-Torrent, J.M., Jové-Deltell, C., & Reverter-Masia, J. (2025). Global Research Trends On Physical Education Practices: A Bibliometric Analysis And Science-Mapping Study. *Frontiers In Sports And Active Living*, 7, Article 1532754. <https://doi.org/10.3389/Fspor.2025.1532754>
- Hutzler, Y., Beck, H., Reichman, B., & Goral, A. (2024). Online Training On Inclusive Physical Education: Differences In Self-Efficacy And Attitudes Of Pre-Service Pe Teachers Across Disability And Activity. *European Journal Of Adapted Physical Activity*, 17, Article 7. <https://doi.org/10.5507/Euj.2024.004>
- Kaplánová, A., Šišková, N., Grznárová, T., & Vanderka, M. (2023). Physical Education And Development Of Locomotion And Gross Motor Skills Of Children With Autism Spectrum Disorder. *Sustainability (Switzerland)*, 15(1), Article 28. <https://doi.org/10.3390/Su15010028>
- Koh, Y.H. (2021). Combining Adapted Physical Education With Individualized Education Programs: Building Korean Pre-Service Teachers' Self-Efficacy For Inclusive Physical Education. *Sustainability (Switzerland)*, 13(5), 1–14. <https://doi.org/10.3390/Su13052879>
- Kwon, H., & Maeng, H. (2022). The Impact Of A Rater Training Program On The Tgmd-3 Scoring Accuracy Of Pre-Service Adapted Physical Education Teachers. *Children*, 9(6), Article 881. <https://doi.org/10.3390/Children9060881>
- Kwon, Y., Kim, D., Kang, M., & Cho, G. (2025). Expanding Participation In Inclusive Physical Education: A Maker-Based Approach For Sport-Marginalized Students. *Children*, 12(12), Article 1681. <https://doi.org/10.3390/Children12121681>
- Langer, W., Bruns, J., & Erhorn, J. (2022). Development And Validation Of A Video-Based Test Instrument To Measure Noticing With Regard To Processes Of Recognition In Inclusive Physical Education. *\*\**, 52(3), 386–397. <https://doi.org/10.1007/S12662-022-00807-0>
- Liberati, A., Altman, D. G., Tetzlaff, J., Mulrow, C., Gøtzsche, P. C., Ioannidis, J. P. A., Clarke, M., Devereaux, P. J., Kleijnen, J., & Moher, D. (2009). The Prisma Statement For Reporting Systematic Reviews And Meta-Analyses Of Studies That Evaluate Health Care Interventions: Explanation And Elaboration. *Plos Medicine*, 6(7), Article E1000100. <https://doi.org/10.1371/Journal.Pmed.1000100>

- Lourenço, C., Ben Rakaa, O., Bassiri, M., & Lotfi, S. (2025). Unravelling The Impact Of Universal Design For Learning On The Inclusion Of Students With Disabilities In Physical Education: A Systematic Review. *\*\**, 25(3), 691–704. <https://doi.org/10.17309/Tmfv.2025.3.27>
- Maher, A.J., & Fitzgerald, H. (2020). Initial Teacher Education And Continuing Professional Development: The Perspectives Of Special School Physical Education Teachers. *Curriculum Studies In Health And Physical Education*, 11(1), 18–33. <https://doi.org/10.1080/25742981.2019.1696687>
- Makopoulou, K. (2018). An Investigation Into The Complex Process Of Facilitating Effective Professional Learning: Cpd Tutors' Practices Under The Microscope. *\*\**, 23(3), 250–266. <https://doi.org/10.1080/17408989.2017.1406463>
- Makopoulou, K., Neville, R.D., Ntoumanis, N., & Thomas, G. (2021). An Investigation Into The Effects Of Short-Course Professional Development On Teachers' And Teaching Assistants' Self-Efficacy. *Professional Development In Education*, 47(5), 780–795. <https://doi.org/10.1080/19415257.2019.1665572>
- Makopoulou, K., Penney, D., Neville, R., & Thomas, G. (2022). What Sort Of 'Inclusion' Is Continuing Professional Development Promoting? An Investigation Of A National Cpd Programme For Inclusive Physical Education. *International Journal Of Inclusive Education*, 26(3), 245–262. <https://doi.org/10.1080/13603116.2019.1647297>
- Mcnamara, S., Ng, K., & Healy, S. (2022). Adapted Physical Educators' Social Media Usage For Professional Learning. *Frontiers In Education*, 7, Article 849919. <https://doi.org/10.3389/Feduc.2022.849919>
- Muñoz-Hinrichsen, F., Marfan, M.S., Contreras, J.P., Lagos, I.V., Roig, M.G., & Pérez-Tejero, J. (2025). Analysis Of Self-Efficacy And Competencies Of Chilean Physical Education Teachers For The Inclusion Of Children With Disabilities. *\*\**, 63, 338–347. <https://doi.org/10.47197/Retos.V63.110144>
- Neville, R.D., Makopoulou, K., & Hopkins, W.G. (2020). Effect Of An Inclusive Physical Education (Ipe) Training Workshop On Trainee Teachers' Self-Efficacy. *Research Quarterly For Exercise And Sport*, 91(1), 102–114. <https://doi.org/10.1080/02701367.2019.1650877>
- Ng, K., Klavina, A., Ferreira, J.P., Barrett, U., Pozeriene, J., & Reina, R. (2021). Teachers' Preparedness To Deliver Remote Adapted Physical Education From Different European Perspectives: Updates To The European Standards In Adapted Physical Activity. *European Journal Of Special Needs Education*, 36(1), 98–113. <https://doi.org/10.1080/08856257.2021.1872848>
- Ng, K., Venckuniene, K., Klavina, A., Labecka, M., Ostaseviciene, V., Pozeriene, J., Strazdina, N., Puomies, M., Reklaitiene, D., & Morgulec-Adamowicz, N. (2025). Associations Between Technology Use, Knowledge And Inclusive Physical Education Teacher-Efficacy Among European Primary School Teachers. *Physical Culture And Sport, Studies And Research*, 108(1), 71–83. <https://doi.org/10.2478/Pcssr-2025-0013>
- Page, M. J., McKenzie, J. E., Bossuyt, P. M., Boutron, I., Hoffmann, T. C., Mulrow, C. D., Shamseer, L., Tetzlaff, J. M., Akl, E. A., Brennan, S. E., Chou, R., Glanville, J., Grimshaw, J. M., Hróbjartsson, A., Lalu, M. M., Li, T., Loder, E. W., Mayo-Wilson, E., McDonald, S., ... Moher, D. (2021). The Prisma 2020 Statement: An Updated Guideline For Reporting Systematic Reviews. *Bmj*, 372, Article N71. <https://doi.org/10.1136/Bmj.N71>
- Park, S. (2023). Faculty Perspective Regarding Practical Experience Of Adapted Physical Education For Undergraduate Students. *International Journal Of Environmental Research And Public Health*, 20(5), Article 4282. <https://doi.org/10.3390/Ijerp20054282>
- Pawlowski, J., & Yun, J. (2019). Adapted Physical Educators' Beliefs And Intentions For Promoting Out-Of-School Physical Activity. *\*\**, 12(1), Article 4. <https://doi.org/10.5507/Euj.2019.003>
- Paz, L.E.T., Barreto, J.C.G., Lozada, E.J.T., Cerna, D.B., & Hernández-Fernández, B. (2023). Approach To The Inclusion Of Students With Disabilities In The Initial Teacher Training Of Physical Education In Peru. *\*\**, 47, 926–968. <https://doi.org/10.47197/Retos.V47.95493>
- Picardo, L., Ferreira, J.P., & Campos, M.J. (2025b). Cross-Cultural Validation Of The Mozambican Version Of The Inclusive Physical Education Self-Efficacy Scale. *\*\**, 64, 853–865. <https://doi.org/10.47197/Retos.V64.107487>
- Picardo, L.F.M.J., Campos, M.J., & Ferreira, J.P. (2025a). Self-Efficacy Of Pre-Service Teachers In Mozambique Regarding The Inclusion Of Students With Disabilities In Physical Education Classes. *\*\**, 31, Article E31029. <https://doi.org/10.22456/1982-8918.142147>
- Reina, R., Hemmelmayr, I., & Sierra-Marroquín, B. (2016). Self-Efficacy Of Physical Education Teachers Toward Inclusion Of Students With Disabilities And Regarding Their Previous Training And Experiences. *\*\**, 8(2), 93–103. <https://doi.org/10.25115/Psyce.V8i2.455>
- Selickaitė, D., Hutzler, Y., Pukėnas, K., Block, M.E., & Reklaitienė, D. (2019). The Analysis Of The Structure, Validity, And Reliability Of An Inclusive Physical Education Self-Efficacy Instrument For Lithuanian Physical Education Teachers. *\*\**, 9(2), 1–17. <https://doi.org/10.1177/2158244019852473>

- 
- Suryobroto, A.S., Setiawan, C., Nampai, U., & Marhaendro, A.S.D. (2022). A Thematic Analysis Of Teachers' Experience In Inclusive Physical Education Teaching. *Cakrawala Pendidikan*, 41(3), 754–763. <https://doi.org/10.21831/Cp.V41i3.50531>
- Tafari, M.G., Gravino, G., Di Palma, D., Palmiero, F., & Romano, G. (2025). Wheelchair Hockey And Inclusion: An Emotional And Relational Analysis In Lower Secondary School. *Journal Of Physical Education And Sport*, 25(7), 1385–1393. <https://doi.org/10.7752/Jpes.2025.07154>
- Thomas, J., & Harden, A. (2008). Methods For The Thematic Synthesis Of Qualitative Research In Systematic Reviews. *Bmc Medical Research Methodology*, 8, Article 45. <https://doi.org/10.1186/1471-2288-8-45>
- Tranfield, D., Denyer, D., & Smart, P. (2003). Towards A Methodology For Developing Evidence-Informed Management Knowledge By Means Of Systematic Review. *British Journal Of Management*, 14(3), 207–222. <https://doi.org/10.1111/1467-8551.00375>
- Tristani, L., Tomasone, J., Gainforth, H., & Bassett-Gunter, R. (2021). Taking Steps To Inclusion: A Content Analysis Of A Resource Aimed To Support Teachers In Delivering Inclusive Physical Education. *International Journal Of Disability, Development And Education*, 68(1), 116–135. <https://doi.org/10.1080/1034912x.2019.1662890>