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# Signature pedagogies of teacher education in physical education: a scoping review

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## ABSTRACT

**Introduction and purpose:** There is a need for contemporary studies which establish a shared language to further analyze and develop pedagogies in the field of teacher education in physical education (PE). This includes both initial teacher education (PE-ITE) and continuous professional development (PE-CPD), holding the responsibility for preparing pre-service teachers (PSTs) and teacher educators, as well as facilitating the ongoing professional learning of in-service teachers (ISTs) and teacher educators. This study entails a comprehensive scoping review covering the period from 2015 to 2023, encompassing studies within the broad field of teacher education in PE across international contexts, all examined through the perspective of Shulman's, L. S. (2005. "Signature Pedagogies in the Professions." *Daedalus* 134 (3): 52–59) concept of signature pedagogies. The purpose was two-fold: (1) to map the current literature on teacher education in PE (including PE-ITE and PE-CPD for both ISTs and teacher educators), and (2) to propose a preliminary shared language of signature pedagogies of teacher education in PE.

**Theoretical lens:** Signature pedagogies refer to the forms of teaching-learning that leap to mind when thinking about the preparation and ongoing learning and development of teachers (i.e. pre-service teachers, in-service teachers and teacher educators; Shulman, L. S. 2005. "Signature Pedagogies in the Professions." *Daedalus* 134 (3): 52–59). Signature pedagogies are both pervasive and routine, cutting across topics and courses, programs, and institutions, and are described through three layers of structure – the surface, deep, and implicit.

**Method:** The research process was guided by a five-stage framework for conducting a scoping review. In line with the specific purposes articulated above, the research question guiding the review was: What is known from the literature on signature pedagogies of teacher education in PE? The search was restricted to articles published between 2015–2023. Both empirical and conceptual articles (i.e. those with data collection and those without) were included, provided the inclusion criteria were met. A total of 465 articles were included in the review, and the pedagogies identified from each article were co-constructed into themes/categories.



**Findings and discussion:** Three signature pedagogies of teacher education in PE across international contexts are identified and presented in terms of their surface, deep and implicit structure, including: (auto)biographical pedagogies, experiential pedagogies, and pedagogies of professional learning. Subsequently, we explore the


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similarities and differences between each of the three groups of pedagogies and what makes a pedagogy of teacher education in PE distinct from a pedagogy of teacher education more broadly.

**Conclusion and further research:** This study offers a preliminary shared language of teacher education pedagogies in the field of PE and is intended to open a dialogue around preparing and supporting pre-service teachers, in-service teachers, and teacher educators in the context of PE. While this review represents an initial step in addressing a gap in the literature by exploring and articulating teacher education pedagogies in PE, there remains a need to analyse their use across teacher education contexts and to consider how this shared language might inform a more intentional practice of these pedagogies within and across teacher education contexts in ways that might ensure more authentic, transformative and equitable teacher education practices in PE.

## Introduction

Teacher education in physical education (PE), encompassing both initial teacher education (PE-ITE) and continuous professional development (PE-CPD), holds the responsibility for preparing pre-service teachers (PSTs) and teacher educators, as well as facilitating the ongoing professional learning of in-service teachers (ISTs) and teacher educators (Loughran 2006; Vanassche et al. 2015). In pursuit of these objectives, over the last several decades, the field has seen the development of a broad array of knowledges, approaches, practices, pedagogies and theoretical perspectives (Curtner-Smith and Fletcher 2024; McEvoy, MacPhail, and Heikinaro-Johansson 2015). Such developments have positively resulted in a vast number of innovative possibilities for teacher education in PE. Yet at the same time, these developments have generated concerns, for instance, that the breadth of information and variety of theoretical perspectives to choose from can be overwhelming (Tinning 2015). This has arguably resulted in the ‘splintering’ of the field into ‘different and potentially disconnected camps’ (O’Connor and Jess 2020, 411). Tinning (2015) argues that such splintering threatens to prevent teacher education in PE from developing into a mature field of study. The impact of splintered, fragmented research and practice in teacher education in PE points to the need for greater coherence in the field, highlighting the potential value of a coherent pedagogy of teacher education in PE (Hordvik, MacPhail, and Ronglan 2020; Tannehill et al. 2021). Thus, in the present research we undertake a comprehensive scoping review of literature on pedagogies of teacher education in PE (including PE-ITE and PE-CPD for both in-service teachers and teacher educators) across international contexts. We approach this through the lens of Shulman’s notion of signature pedagogies with the aim of offering a preliminary shared pedagogical language for teacher education in PE.

### *From fragmentation to coherence*

Fragmentation in the field has arguably fueled a number of challenges that play out in various ways in teacher education in PE. For instance, PE-ITE has been criticized for falling short of effecting change, having little impact on and tending to confirm rather than challenge PSTs’ beliefs about the purposes, content, and teaching of PE (Adamakis and Dania 2020). While teaching-learning are undeniably complex processes, this may be amplified by the theoretical fragmentation of PE-ITE, where, instead of a holistic approach designed by integrating different paradigms, single paradigms are often used as the foundations to construct such programs (Calderón and MacPhail 2023). In this way, PSTs leave their PE-ITE programs ‘with eyes wide shut to the possibilities that other perspectives and forms of theory and professional understanding might offer’ (Evans 2014, 55–56). Similarly, while PE-CPD has been deemed critical for the continuous improvement of PE

(Parker and Patton 2016), these initiatives tend to be fragmented across international contexts. Although the diversity of local-national contexts can add value to the teaching-learning process, this fragmentation has, at times, led to inconsistencies and inequities. For instance, data from twenty-five European countries revealed a range of different PE-CPD provisions, from centralized compulsory courses (i.e. required of ISTs) to decentralized non-compulsory opportunities and with a range of differences in the purposes, content, duration, format, and accompanying support materials/resources of PE-CPD programs (Tannehill et al. 2021). Consequently, the authors have argued for the importance of a more coherent approach to PE-CPD across contexts. Further, teacher educators themselves play an influential role in both ITE and CPD (Vanassche et al. 2015). Yet, efforts to support the professional learning of teacher educators have been fragmented at best and are more often altogether absent. Consequently, many teacher educators have had to seek out their own professional learning experiences, either independently (e.g. North 2017) or through collaboration (e.g. Hordvik et al. 2021), emphasizing the need for concerted, intentional preparation of and CPD for teacher educators (Czerniawski et al. 2023).

In light of these challenges, in recent years, there have been calls for PE teacher educators to move beyond isolated discourse communities (Lawson 2008) and begin to engage in ideational border crossing, through the sharing of thought, practice, and resources within/between intellectual communities (Evans 2014). This will arguably help to 'bridge points of division amidst disciplinary knowledge structures' (O'Connor and Jess 2020, 409). Evans (2014) argues that, while border crossings have never been more necessary in teacher education in PE, they have also never been more unlikely to occur. Thus, there is a need to engage in intentional efforts to promote greater coherence in research and teaching practice in the field of teacher education in PE. Within the last decade, it has been argued that developing and articulating a pedagogy of teacher education in PE offers a potential avenue for greater coherence in the field (Hordvik, MacPhail, and Ronglan 2020; Tannehill et al. 2021).

### *Developing and articulating (signature) pedagogies of teacher education in PE*

Scholar have highlighted the value of a pedagogy of teacher education in PE, for instance, to point to common 'principles of practice and elements of teacher education programmes and practices' (Fletcher 2016, 361) in PE that are best suited to support PSTs', ISTs' and teacher educators' learning. Similarly, there has been increasing interest in identifying signature pedagogies of teacher education in PE (O'Sullivan 2018) – the forms of teaching-learning that leap to mind when thinking about the preparation and continuous support of teachers in the field of PE across contexts (Shulman 2005). As an example, Parker, Patton, and O'Sullivan (2016) have pointed to the value of large-scale, cross-department research initiatives to explore signature pedagogies of teacher education in PE for providing a foundational knowledge base from which teacher educators might choose pedagogies to best support specific teacher education outcomes.

In the context of this study, a pedagogy of teacher education is defined as the theory and practice encompassing the preparation of PSTs and teacher educators, as well as the ongoing professional learning of ISTs and teacher educators (Loughran 2006; Vanassche et al. 2015). According to Loughran (2013), a pedagogy of teacher education includes the interconnected relationship between teaching-learning. In most teacher education contexts, this dynamic involves teacher educators teaching about teaching-learning, while learners, such as PSTs and ISTs, engage in the process of learning about teaching-learning. As those who are responsible for orchestrating these interrelated and complex teaching-learning processes (Hordvik, MacPhail, and Ronglan 2020), teacher educators play a pivotal role by employing pedagogical approaches and strategies that they believe are appropriate for learning in the specific context (Loughran 2006). While the development of a pedagogy of teacher education in PE is still in its infancy (McEvoy, MacPhail, and Heikinaro-Johansson 2015), examples in the literature provide key insights into the development and articulation of (signature) pedagogies within teacher education in PE. Below, we highlight some of these examples.

Baker and Fletcher (2017) emphasized the importance of PSTs learning both about and through the specific pedagogical approaches taught in their ITE program. This learning process involves strategies where PSTs learn about the theory of an approach, such as its theoretical foundations, teaching-learning features, and implementation needs and modifications. Simultaneously, PSTs also learn through the approach by engaging in experiences where they function both as learners and teachers. This aligns with the approach of 'living the curriculum', where PSTs experience a similar approach to what their students will (Sinclair and Thornton 2018). Through these pedagogies, teacher educators model appropriate teaching practices while articulating the 'hows' and 'whys' of their teaching (Fletcher and Casey 2014). Teacher educators might also model other aspects of being and becoming a teacher, such as engaging in reflective practice (Hordvik et al. 2021) or the use of practitioner research (MacPhail 2011).

Practitioner research, particularly self-study of teacher education practices (S-STEP), has also been employed to develop and articulate a pedagogy of teacher education in PE. For instance, Fletcher (2016) retrospectively examined and made connections across several S-STEP research projects, leading him to elucidate three fundamental principles underpinning his pedagogy of teacher education in PE: (a) building community, (b) explaining and reflecting upon modeling, and (c) acknowledging the significance of identity matters. In another example, from a post-human perspective, Hordvik, MacPhail, and Ronglan (2020) used S-STEP to purposefully investigate and elucidate the intricate interplay between interactive human and non-human elements, showcasing how they jointly influence the dynamics of teaching-learning in teacher education. This emphasises the inherently complex nature of teacher education pedagogy, leading the authors to a metaphor of 'orchestration' to conceptualize a pedagogy for teacher education. This metaphor encourages teacher educators to not only recognize the collaborative amalgamation of elements shaping teaching-learning but also to use this understanding in planning, analyzing, and adjusting their pedagogical approaches.

Others have focused explicitly on transformative and democratic pedagogies in PE-ITE. For instance, Lynch and Curtner-Smith's (2020) study of three teacher educators revealed the use of a wide variety of transformative pedagogies, including, for example, storytelling, discussion and debate of critical cases, place-based pedagogies, peer teaching, inquiry-based learning, role-play, critically-focused clinical experiences, and negotiation. Ovens and Lynch (2019) have argued for the importance of a democratic pedagogy to function as a transformative space for PE-ITE practices, outlining four key themes that characterize it: (i) Redefining the role of the teacher educator, (ii) Rich connections and emergent curriculum, (iii) Personal growth assessment, and (iv) Community-orientated practicums.

Finally, in the context of PE-CPD, a meta-review of literature published from 2005 to 2015 on PE-CPD revealed three signature pedagogies tailored to the professional development of ISTs including (a) critical dialogue, (b) public sharing of work, and (c) communities of learners (Parker, Patton, and O'Sullivan 2016).

While these examples provide important insights concerning a pedagogy of teacher education in PE, they have been conducted in isolated contexts and often focus on a particular kind of pedagogy. Through this review, we seek to respond to calls in the literature to provide a cross-national analysis of pedagogies of teacher education in PE (O'Sullivan 2018). By examining a diverse array of pedagogies in various contexts, we intend to contribute to a more comprehensive understanding of the development and articulation of a pedagogy for teacher education in PE, with a specific focus on signature pedagogies in the field. However, we echo the assertion of O'Connor and Jess (2020) who argue that intentional efforts to promote greater coherence in the field should not be taken 'to suggest we must shift to a form of holism or universality' (410). Further, we see value in the diversity unique contexts and cultures, both across international borders and within different institutions, can offer. In this way, it is our intention to point to the value of developing and articulating signature pedagogies of teacher education in PE as offering a framework for greater coherence in the field while resisting the notions of prescriptive practice or calls to fidelity regarding use of signature pedagogies.

## Theoretical lens: signature pedagogies

Signature pedagogies refer to the forms of teaching-learning that leap to mind when thinking about the preparation and ongoing learning and development of members of a particular profession (e.g. doctors, lawyers, teachers; Shulman 2005). In teacher education, these pedagogies – for example, case-based learning, use of teaching metaphors, modeling – represent characteristic forms of teaching that shape the foundational ways in which PSTs, ISTs, and teacher educators are learning and developing. Shulman (2005) argued that signature pedagogies are both pervasive and routine, cutting across topics and courses, programs and institutions, and can be described through three layers of structure – the surface, deep, and implicit.

The *surface structure* of any signature pedagogy consists of the concrete, operational acts of teaching-learning and describes what the pedagogy *is* (for example, peer teaching). A signature pedagogy also possesses a *deep structure*, as it is constructed upon a set of underlying assumptions about the most effective ways to convey a particular body of knowledge (i.e. what the pedagogy *does* in terms of learning). For example, peer teaching aims to develop pedagogical skills and confidence to teach in a modified setting. The third dimension of any signature pedagogy is its *implicit structure*: ‘a moral dimension that comprises a set of beliefs about professional attitudes, values, and dispositions’ (Shulman 2005, 55), which are transmitted to learners through engagement with the pedagogy. In the case of the example used, peer teaching is designed to challenge beliefs and values about teaching-learning in PE and encourage development of critical thinking and reflexivity.

In some cases, critics have contended that the concept of signature pedagogies infringes upon the autonomy of teacher educators, suggesting that they should have the freedom to employ their own pedagogies. However, Shulman rejected this notion, emphasizing the necessity of a shared and research-informed practice if teacher education is to stand alongside other respected professions and prove that it is ‘no longer a field where we let a thousand flowers bloom’ (Falk 2006, 76). While we agree with Shulman’s assertion of the potential value of signature pedagogies as providing an avenue for greater coherence in the field by contributing to a shared pedagogy of teacher education, we also see the notion of signature pedagogies as holding some potential risks. For instance, signature pedagogies may further enhance the boundaries between different ‘camps’ if/when they are used prescriptively or in a way that excludes practices and ideas that might be innovative or originate from diverse (sub-)disciplinary areas. Importantly, from our perspective, the notion of shared and research-informed practices should not be taken to imply that these pedagogies should be seen as fixed or static constructs. Instead, they should be viewed as dynamic teacher education approaches that require adaptation and evolve in response to changing demands and contexts. Teacher educators should, therefore, continually engage in the process of refining, adapting and developing pedagogies to align with their beliefs, learners’ needs and concerns, and their specific educational contexts.

In spite of the risks, we believe identifying signature pedagogies in the field is a worthwhile endeavor. They hold the potential to offer ‘a shared language’ by which teacher educators and students of teaching can describe, discuss and ‘grasp more than “the how” [of teaching and learning], but to also be engaged in unpacking “the why” of their rich learning about teaching experiences’ (Loughran 2013, 133). Understanding of the ‘why’ (or purpose) of the teaching-learning process is arguably in need of greater attention in teacher education in PE (Quennerstedt 2019).

## Study positioning and purpose

This study is part of the larger research and development project ‘PhysEd-Academy’, involving 27 teacher educators and 22 in-service teachers from higher education institutions and schools across seven European nations, as well as two PE associations. The aim of the overarching project is to contribute to an innovative conceptualization of and coherent approach to teaching and teacher education in PE. The project involves sustainable, international collaboration between teachers

and teacher educators to identify, articulate, explore, and refine signature pedagogies of teacher education in PE across international contexts.

We recognize the non-linear and complex nature of teaching-learning, involving ongoing decision making regarding the ‘why(s)’, ‘what(s)’, and ‘how(s)’ of education within specific contexts and situations (Quennerstedt 2019). In line with the conceptualization of signature pedagogies as dynamic and shared processes, the objective of this study is to propose a preliminary common language pertaining to signature pedagogies. This approach aligns with the one proposed by Parker, Patton, and O’Sullivan (2016) and does not intend to prescribe a rigid or singular method for teacher education in PE. This language can serve as a foundation for teacher educators and teacher education programs to build upon when further analysing, developing and articulating a pedagogy of teacher education in PE (Loughran 2006). The twofold purpose of this study is: (1) to map the current literature on teacher education in PE (including PE-ITE and PE-CPD for both ISTs and teacher educators) and (2) to propose a preliminary shared language of signature pedagogies of teacher education in PE.

## Methods

This study is most closely aligned with a scoping, rather than systematic, review process by providing insight on a particular topic area without providing quality assessment of the included articles (Arksey and O’Malley 2005). The process was guided by Arksey and O’Malley’s (2005) five-stage framework for conducting a scoping review, which prioritizes explicit transparency at each stage of the process to promote rigour and enhance trustworthiness. *Phase one: identify the research question.* The research question guiding the review was: What is known from the peer-reviewed literature on signature pedagogies of teacher education in PE? *Phase two: identify relevant studies.* Three databases were identified as those most relevant to the research topic, encompassing the fields of education, sport and science/health: ERIC, SportDiscus, and Web of Science. The initial search was conducted in September 2022. Prior to this, an iterative process of trial searches was undertaken to determine which search terms would retrieve the widest range of pertinent studies. In this process, we noticed that the terms ‘physical education teacher education’ or ‘continuous professional development’ and ‘physical education’ combined with ‘signature pedagogy’ and its synonyms ‘pedagogy’, ‘teaching’, ‘instruction’, ‘curriculum’, ‘learning’ covered nearly all articles published within the field of teacher education in PE, with only 50–70 articles difference when a term related to pedagogy was added. Given how small the difference was, terms related to pedagogy were removed from the search. The following set of terms were searched in all three databases:

1. ‘physical education teacher education’ OR PETE OR ‘physical education’ AND ‘teacher education’
2. ‘professional development’ OR ‘continuing education’ AND ‘physical education’

In aiming to keep the review as comprehensive as possible, articles published in any language read by one or more members of the project team were included: English, Norwegian, Swedish, Danish, German, Turkish, Spanish, or French, though it is important to note that using English search terms limited results to only those articles with a title and abstract published in English. The search was restricted to articles published between 2015–2023. This time frame was chosen as we were aware of major literature reviews on PE teacher educators (McEvoy, MacPhail, and Heikinaro-Johansson 2015) and PE-CPD (Parker, Patton, and O’Sullivan 2016) which covered the period up to that point. The initial search resulted in 2,596 articles being identified, from which 62 duplicates were removed.

*Phase three: study selection.* The following primary inclusion criterion was established: the article must contain an explicit and detailed description of the teacher education pedagogy/-ies used and/or recommended. The pedagogy did not necessarily need to be the primary focus of the article for

inclusion, provided a detailed description was given. We drew from the work of Vanassche et al. (2015) and Loughran (2006) to define a ‘pedagogy’ in this context as including any method or approach to supporting (a) the preparation of PSTs or teacher educators and/or (b) the ongoing professional learning and development of ISTs and teacher educators. Both empirical and conceptual articles (i.e. those with data collection and those without) were included, provided the inclusion criteria were met. Importantly, a distinction was drawn between teacher education pedagogies (i.e. those which teacher educators use in PE-ITE and PE-CPD) and school-based PE pedagogies (i.e. those which teachers use with students in their PE classrooms), with only the former being relevant for inclusion. Author one and another member of the team reviewed the titles and abstracts of the 2,534 identified articles in relation to the inclusion criteria. At this stage, 1,595 articles were excluded on the basis of irrelevance (e.g. not based in teacher education in PE, focused on teachers’ experiences rather than pedagogy).

Author two screened the full text of the remaining 939 articles, with the exception of those published in a language other than English ( $n = 51$ ) which were screened by other members of the research team. An additional 522 articles were excluded at this stage, with a total of 417 articles from the initial search being included in the review. A second search was conducted for articles published between September 2022 and August 2023 before submission of the manuscript. This search resulted in the inclusion of an additional 47 articles. In total, 464 articles were included in the review. Figure 1 summarizes the review process.

*Phase four: charting the data.* For each of the included articles, author two extracted and charted relevant information in an Excel spreadsheet including: authors, year of publication, abstract, context (PE-ITE, PE-CPD, or Teacher educator CPD), participants, name and description of pedagogies, data collection methods, and location of the research (or authors, for conceptual articles). Appendix A provides details of each included article.

*Phase five: collating, summarizing, and reporting results.* In the final phase of the review, the authors grouped the identified pedagogies from each article into themes/categories. This was an iterative process, as themes were collapsed, expanded, grouped, and regrouped several times. Two ‘meta-critical friends’ (Fletcher, Ní Chroinín, and O’Sullivan 2016), both of whom teacher

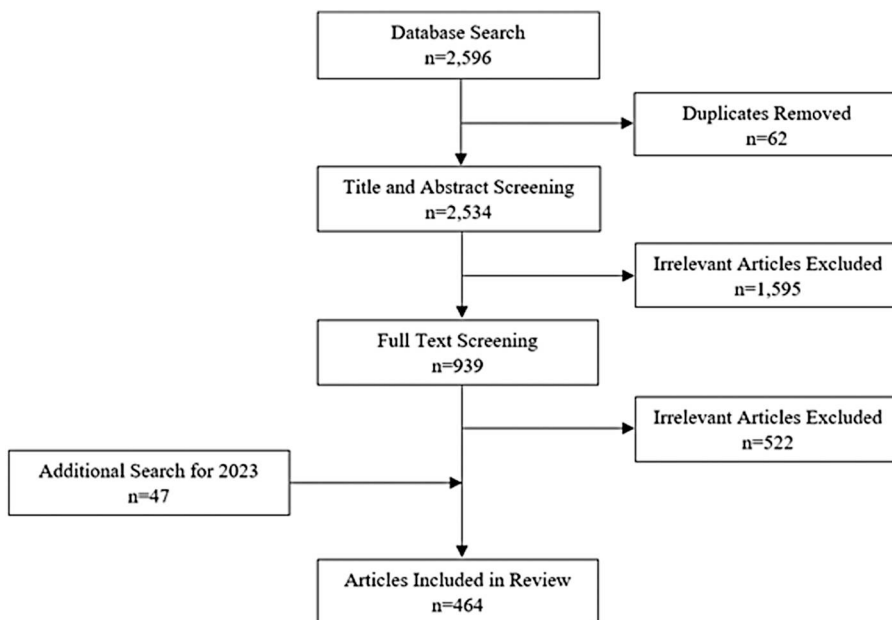


Figure 1. The review process.



educators well-versed in the literature of teacher education in PE but not previously engaged in the review, offered feedback on the categorization of signature pedagogies twice. This encouraged us to collapse certain groupings, change labels or remove groups (e.g. recategorizing ‘socio-cultural pedagogies’ under ‘pedagogies of professional learning’). After settling on three primary groupings of signature pedagogies with several examples within each category, project members were assigned specific articles associated with these examples. Their task was to analyze and identify the surface, deep, and implicit structures within them. Subsequently, the groupings and examples were deliberated upon during a project meeting involving 19 teacher educators and six in-service teachers. The outcomes of these deliberations were leveraged by the authors to formulate the definitive groupings and examples, which are presented in the following section.

## Signature pedagogies of teacher education in PE

The three groups of signature pedagogies identified through the review include: (a) (auto)biographical pedagogies, (b) experiential pedagogies, and (c) pedagogies of professional learning. Importantly, these signature pedagogies are representative of those which were encountered frequently in the literature and across international contexts (in line with Shulman’s notion of signature pedagogies). Consequently, there are pedagogies used in some of the articles reviewed which are not captured in these groupings. For a comprehensive list of pedagogies and the contexts they were used in, readers are referred to Appendix A. Furthermore, it is beyond the scope of this review to consider the outcomes associated with these pedagogies (e.g. impact on PSTs’ or ISTs’ learning). In the sections that follow, we identify the surface, deep, and implicit structures of each signature pedagogy through considering several examples of specific pedagogical approaches within each grouping. Table 1 provides a summary of the three signature pedagogies and their structures.

In Table 1 and the subsequent sections, we employ the term ‘teacher’ in a broad sense when referring to the learner in teacher education contexts, encompassing PSTs, ISTs, and teacher educators. We employ the specific terms when necessary to offer readers a clear understanding of the specific context to which the discussion of these pedagogies relates in the literature. Given the vast number of articles included in the review, we restrict the reference list in this section to only those articles cited which are not included in the review; all reviewed articles can be found in Appendix A.

**Table 1.** Identification of signature pedagogies’ surface, deep, and implicit structures.

Signature Pedagogy	Surface Structure	Deep Structure	Implicit Structure (Moral)
(Auto)biographical Pedagogies	Teachers learn through engaging with and reflecting on stories and experiences (own or others; real or fictional; past, present or future). May involve one or more reflective techniques in a variety of formats.	Teachers develop the ability to think critically and reflectively and be sensitive to own and others’ experiences through challenging and developing beliefs about teaching-learning.	Disrupt teachers taken-for-granted ways of thinking; empower teachers to advocate for change and an ideal vision for teaching-learning.
Experiential Pedagogies	Teachers learn through bodily and lived teaching-learning experiences, in authentic settings, as both teachers and learners. Teachers reflect on and discuss own and others’ experiences.	Teachers develop pedagogical skills and confidence for teaching in diverse settings and with various populations, helping to bridge the theory-practice gap.	Challenge teachers’ values and beliefs about teaching-learning; nurture teachers sensitively to the complex nature of teaching-learning and the diversity of learners.
Pedagogies of Professional Learning	Teachers learn through collaborating in a pair or group with a shared vision and goal to improve and better understand their practice(s).	Teachers develop the self for professional growth in a safe, collective, and supporting environment.	Encourage teachers to think critically about their own practices and take risks in learning to implement new approaches.

### **(Auto)biographical pedagogies**

(Auto)biographical pedagogies are conceptualized as the construction of knowledge through critical reflection on beliefs, values, and personal experiences and thus tend to be grounded in theories concerning teachers' beliefs and the role of reflection in teacher learning (e.g. Darling-Hammond and Bransford 2007; Pajares 1992; Schön 1983). Generally speaking, these theories draw a connection between engaging in intentional reflective practice and the challenging and disruption of teachers' taken-for-granted beliefs. In the literature, these pedagogies were found to be used predominantly in the context of PE-ITE to support PSTs' learning. Occasionally, they have been used by teacher educators to support their own professional learning (e.g. collective biographical narrative; Dowling et al. 2015).

At a **surface level**, teachers engage with and reflect upon stories, experiences, and situations. In some cases, teachers are asked to reflect on their *own* stories through engaging in, for instance, autobiographical narrative inquiries (Miranda and Silva-Pena 2022) and essays (Richards et al. 2022), writing and reflecting upon their own life histories (González-Calvo et al. 2021), or journaling about their bodily experiences (González-Calvo et al. 2019). In other instances, teachers reflect on the stories of others through pedagogical approaches such as vignettes (Lambert 2020), biographies (Philpot 2019), cases (Hemphill et al. 2015), examples (Heemsoth and Kleickmann 2018) and photo stories (Owens et al. 2016). While some of these stories may provide insight into real-life experiences, the use of fictional tales is also commonplace (Pérez-Samaniego et al. 2016). Often the stories teachers reflect upon have occurred in the past (e.g. life history or biography) or relate to present engagement (e.g. journaling about experiences in PE-ITE). However, in some cases, they may include a focus on the future, such as asking teachers to articulate a vision for future teaching practice (Ní Chróinín et al. 2019). In addition to involving a variety of reflective techniques, these stories can be presented in a variety of formats. Beyond text-based stories and examples, the use of video to stimulate reflection and recall (Backman et al. 2023) and to present cases and examples (Heemsoth et al. 2022) is becoming increasingly popular, as is the use of photos (Walker et al. 2017) and other participatory visual methods (Parker, Patton, and O'Sullivan 2016).

In terms of the **deep structure** of (auto)biographical pedagogies, their use is thought to lead teachers to develop the ability to think critically and reflectively and to be sensitive to their own and others' experiences. This involves both challenging and developing personal beliefs about teaching-learning. (Auto)biographical pedagogies encourage teachers to 'confront their own experiences' (González-Calvo et al. 2021, p. 934) and 'think critically about [...] the associated implications for their views about teaching' (Richards et al. 2022, p. 160). In this way, these pedagogies are thought to help teachers overcome the socializing impact of prior experiences of PE and sport, allowing them to 'recognise, reflect upon, interrogate and reframe their [...] preconceptions of PE' (Haynes et al. 2016, p. 23). Seeing alternative examples of what PE might look like, for instance through cases, can help to provide a vision for a reimagined PE (or teacher education) experience (Heemsoth et al. 2022). In addition to helping teachers make sense of their own experiences, (auto)biographical pedagogies can promote 'vicarious learning' (Hemphill et al. 2015), prompting teachers to consider the experiences of others. For instance, Lambert (2020) highlights the value of pre-text vignettes for helping PSTs understand 'what thinking, sensing, feeling and sharing 'in' movement looks, feels, smells, sounds and tastes like' (162) for others.

**Implicitly**, through facilitating critical reflection of experiences, (auto)biographical pedagogies can lead to the disruption of taken-for-granted beliefs and ways of thinking and empower teachers to advocate for change and an ideal vision for the future of PE and teacher education, both in their own practices and more broadly in the field. In this way, (auto)biographical pedagogies are intended to 'provoke' teachers to ask questions and allow a broad array of experiences to inform decision-making about the who, why, what, and how of PE (Hemphill et al. 2015). Through deliberately challenging and destabilizing norms (Lambert 2020), story-based approaches are thought to 'allow [teachers] access to the capacity to recognize unjust, divisive, insensitive, and limiting

practices in sport and physical activity and enable a more socially just response' (Hennig et al. 2020, p. 669) and, in this way, are often used to facilitate transformative objectives. For example, engaging PSTs in comparing their own autobiographical narrative inquiries to those of others allows them to consider experiences of adversity and 'otherness' and how they might advocate for socially just forms of PE (Hennig et al. 2020).

### **Experiential pedagogies**

Experiential pedagogies are conceptualized as those which strive to provide teachers with an authentic, real-world learning experience related to various aspects of the teaching profession. The reasoning behind the use of these pedagogies tends to be grounded in the work of experiential learning theorists (e.g. Dewey 1938/1997; Kolb 1984). Generally speaking, experiential learning theories posit that active engagement in an authentic environment, followed by reflection upon the experience, produces deeper learning experiences (Du Toit 2019). In the literature, a wide variety of experiential pedagogies were used across international contexts, predominantly within the context of PE-ITE for PSTs and occasionally integrated into PE-CPD opportunities for ISTs. In terms of the number of articles reporting the use of each signature pedagogy, experiential pedagogies were the most common.

The *surface structure* of experiential pedagogies involves teachers learning through bodily and lived teaching-learning experiences, in authentic settings, as both teachers and learners. Subsequently, teachers often reflect on and discuss their experiences in these contexts. Modeling of appropriate practice and 'living the curriculum' (Oslin, Collier, and Mitchell 2001) were commonly used PE-ITE pedagogies to support PSTs in experiencing school-based PE content and pedagogy as *learners* (i.e. as their future students may experience such practices). For instance, teacher educators modeled various aspects of teaching such as technology integration (Krause and Lynch 2018), pedagogical approaches and models (Langnes and Walseth 2023), social justice pedagogies (Cervantes and Clark 2020) and assessment practices (Young et al. 2022). Living the curriculum has been used to provide PSTs with, for instance, genuine experiences of outdoor and adventure education (Dillon et al. 2017) and various pedagogical models (Hordvik et al. 2019). Other experiential pedagogies were aimed at providing PSTs with an embodied experience of PE as others might experience it (e.g. disability simulations; Maher et al. 2020).

To support PSTs' experiential learning as *teachers*, many PE-ITE programs and courses included opportunities for PSTs to engage in some form of teaching. These varied in terms of who PSTs were teaching, for example, peer teaching (Kjerland and Annerstedt 2022) versus student teaching (Chatoupis 2017) opportunities, and in terms of the duration and format, including opportunities for micro-teaching (Sevimli-Celik 2021), teaching rehearsals and repeated teaching (Ward and Cho 2020), 'live practice' (van der Mars et al. 2018), and longer-term opportunities involving field work, practicum, or placement (e.g. Luguetti and Oliver 2020). School placements in particular were extremely commonplace in PE-ITE. Even where other types of pedagogies were used, they were often complementary to placement/practicum opportunities, which tended to be a mainstay across international contexts. While these types of experiences often occurred in traditional PE settings (i.e. university or school), other experiential pedagogies took PSTs into less-traditional contexts. For instance, service-learning provided opportunities for civic engagement within a local community (Lleixà and Ríos 2015) while other approaches involved opportunities for PSTs to participate in a cultural exchange or excursion (Legge 2015).

While experiential pedagogies such as school placement have long been a mainstay of teacher education, within the time frame covered by this review, the impact of covid 19 spotlighted the importance of experiential pedagogies, as many PSTs missed this key part of their teacher education program. While the review shows efforts to engage in online practicum, the lack of authentic experiential opportunities has been identified by teacher educators and PSTs alike as diminishing their PE-ITE experience (O'Brien et al. 2020; Varea, Gonzalez-Calvo, and García-Monge 2022).

In terms of their *deep structure*, experiential pedagogies encourage teachers to develop pedagogical skills and confidence for teaching in diverse settings and with various populations. For instance, Winslade et al. (2016) argue that an international field experience in PE-ITE can help PSTs to develop a ‘repertoire of culturally responsible teaching practices’ (10). Living the curriculum has been used with the intention to improve teaching skills and promote emancipatory pedagogical practices (Hortigüela-Alcalá et al. 2021). Other approaches are purported to help change ISTs’ practice and their expectations around student learning (Chatoupis 2017) and to improve PSTs’ confidence in working with students with disabilities (Woodruff and Sinelnikov 2015). Collectively, experiential pedagogies are aimed to influence teachers’ ability and willingness to engage with diverse school-based pedagogy and populations in PE.

*Implicitly*, experiential pedagogies can lead to the challenging of teachers’ values and beliefs about teaching-learning and assumptions about learners’ individual needs. This helps teachers to develop sensitivity to the complex nature of teaching-learning and the diversity of learners and allows teachers to begin to form their professional identity. For instance, experiential pedagogies hold potential to broaden PSTs’ beliefs about ability and impairment (Douglas et al. 2019) and to lead PSTs to think ‘in more complex and nuanced ways about learning as social, affective and cognitive, as well as physical’ (Maher et al. 2022, p. 658). Similarly, field-based experiences are advocated for on the premise of providing PSTs with opportunities to think deeply about their former socialization experiences (e.g. as students in PE) and (re)consider areas of misalignment between their subjective theories (i.e. personal understandings and beliefs about PE) and appropriate teaching-learning practices advocated for in PE-ITE (McEntyre and Richards 2023).

### *Pedagogies of professional learning*

Pedagogies of professional learning are conceived of here as those which primarily prioritize teachers’ ongoing professional growth and development. The reasoning behind the use of these pedagogies tends to be grounded in pragmatism (Dewey 1938), situated learning theory (Lave and Wenger 1991) and reflective practice (Schön 1983). In general, these theories propose that engaging in systematic collaboration and/or inquiry into one’s personal or collaborative practices, with the goal of individual and collective improvement, leads to positive changes in teachers’ experiences, identities, and practices. Throughout the literature, these pedagogies were used predominantly to support ISTs’ CPD and were grounded in the literature on effective forms of professional development, most notably, the importance of continuous learning within an active and social learning environment (e.g. O’Sullivan and Deglau 2006; Parker and Patton 2016). Additionally, there were also several instances in which these pedagogies were used by teacher educators to support their own self-initiated professional learning, and in a few instances, as a compliment to other PE-ITE pedagogies to support PSTs’ learning.

The *surface structure* of pedagogies of professional learning involves teachers collaborating in a pair or group with a shared vision/goal to improve and better understand their practice(s). Importantly, the notion of a ‘shared vision’ does not necessarily imply the same outcomes from involvement in the process. For example, an IST might receive CPD support to improve their PE practice from a teacher educator who simultaneously studies their own experience of learning to facilitate CPD and publishes the results. From the several examples found in the literature, we identified two sub-groups of pedagogies of professional learning including: (1) learning communities and (2) practitioner inquiry.

First, across a wide array of contexts, learning communities occurred in many forms, for instance, as professional learning communities (Bowes and Tinning 2015), communities of practice (Goodyear and Casey 2015), collaborative groups (Weaver et al. 2018); inquiry-oriented learning communities (Calderón and Tannehill 2021) and international teaching communities (Lawson et al. 2021). Learning communities were used to support PSTs’, ISTs’, and teacher educators’ professional learning. Although they occurred primarily face-to-face, there were also examples of online communities (e.g. Gorozidis et al. 2020).

Second, pedagogies of practitioner inquiry focus on one or more teachers inquiring into their own teaching practice with the support of one or more critical friends. Examples of pedagogies of practitioner inquiry include approaches such as self-study of teaching and teacher education practices (S-STTEP), action research, and lesson study. S-STTEP was a commonly used approach for supporting teacher educators' (and to a lesser extent, ISTs') self-initiated professional learning and occurred in a variety of formats, such as, collaborative S-STTEP (Hordvik et al. 2021) and layered critical friendship (Fletcher, Ní Chroínín, and O'Sullivan 2016) amongst teacher educators and poetic collaborative S-STTEP with teacher-researchers' (Varea, Gonzalez-Calvo, and García-Monge 2022). Action research and lesson study tended to be used to support PSTs' learning, for instance, within a practicum (Ryan 2020) and ISTs' CPD, such as when learning to use pedagogical models (Gray et al. 2019) or needs-supportive teaching (Slingerland et al. 2021).

In relation to their *deep structure*, pedagogies of professional learning allow for engaged interaction and reflection for teachers to develop the self for professional growth, within a safe, collective, and supporting environment. For instance, Patton and Parker (2017) highlight the value of communities of practice, which provide opportunities for ongoing dialogue and reflection within an atmosphere of mutual respect, allowing for deep learning to occur. Much of the professional growth that occurs through pedagogies of professional learning happens predominantly through the identification of challenges and the exploration of new approaches and solutions. For instance, Calderón and Tannehill (2021) argue that collaborative inquiry learning communities can support ISTs in identifying challenges they have in common, analysing relevant data, and exploring new pedagogical approaches, ultimately leading to improved teacher and student learning. Engagement in both learning communities and forms of practitioner inquiry are thought to have the potential to foster a deeper sense of self-efficacy in teachers as they share both teaching-related problems and solutions (Hunuk and MacPhail 2022; Brooks and McMullen 2020).

*Implicitly*, through pedagogies of professional learning, teachers learn to think critically about their own practices and take risks in learning to implement new approaches. For instance, engaging in S-STTEP requires teacher educators to begin with 'a willingness to risk exposure of self in order to open up alternative ways of being a teacher educator and doing teacher education' (Mong and Standal 2022, p. 742). Within the context of learning communities, teachers make themselves vulnerable before trusted colleagues by sharing both successes and failures for collective reflection and learning (Patton and Parker 2015). This can involve developing and working toward a shared vision of practice (Ní Chroínín et al. 2019) and/or the challenging of one's own vision through evaluating the perspectives of others (Dornstauder and Chorney 2019). The collaborative, reflective nature of pedagogies of professional learning can lead to the 'exposing of dichotomous thinking and contradictions' (Stevens and Thompson 2022, p. 247) as teachers work to improve their practice. Given the vulnerability required, the facilitation of a democratic space in which teachers feel 'comfortable to share, listen and learn together' (McMullen et al. 2022, p. 82) and empowered to 'take risks and struggle with their challenges' (Gonçalves et al. 2022, p. 340) is essential within pedagogies of professional learning.

## Discussion

The impact of splintered, fragmented research and practice in teacher education in PE has resulted in a growing call to analyse and develop signature pedagogies across various teacher education contexts and programs in PE to facilitate the articulation of individual and collective pedagogies across locations and serve as the foundation for developing a pedagogy of teacher education in PE (Parker, Patton, and O'Sullivan 2016; Tannehill et al. 2021). The purposes of this review have been to map the current literature and outline a preliminary shared language of signature pedagogies in teacher education in PE. We have identified three signature pedagogies across international contexts: (auto)biographical pedagogies, experiential pedagogies, and pedagogies of professional learning. We now explore the similarities and differences between each of the three groups of pedagogies

and what makes a pedagogy of teacher education in PE distinct from a pedagogy of teacher education more broadly.

### *Similarities and differences between the signature pedagogies*

There are both similarities and differences between each of the three signature pedagogies. A common thread across all three pedagogies is a strong emphasis on engaging in personal reflection and developing the ability to engage in critical thinking. Likewise, in each of these pedagogies, there is a focus on connecting learning in the specific teacher education context (i.e. PE-ITE, PE-CPD, teacher educator CPD) to real world, authentic experiences of teaching-learning, through telling stories, facilitating experiences, and situating learning and inquiry in local contexts. In each case, teachers are positioned as active participants in their own learning journey and are encouraged to navigate teaching-learning contexts and situations in collaboration with others. In this way, a major outcome of each signature pedagogy is to facilitate the bridging of the theory-practice gap through incorporating teaching-learning activities that integrate authentic experiences, collaboration, reflection and active participation in diverse and meaningful ways, nurturing both individual and collective teacher identities, beliefs, and practices (Darling-Hammond and Bransford 2007; Dewey 1938; Schön 1983).

Further, each of these signature pedagogies plays a crucial role in facilitating teachers' learning across a wide range of content areas (e.g. school-based PE pedagogy, activities, assessment strategies, etc.) and to support diverse groups of learners. For example, pedagogies of professional learning, which traditionally have been used exclusively by teacher educators to support ISTs' professional learning, are now being increasingly integrated into PE-ITE contexts to support PSTs' learning as well. However, despite some evidence of these pedagogies being applied in various context, there is substantial potential for further exploration into how each signature pedagogy could be more comprehensively utilized across diverse teacher education contexts, including the preparation and CPD of teacher educators. As an illustration, experiential pedagogies are predominantly utilized within the context of PE-ITE, leaving room for further investigation and adaptation in other contexts.

In addition to the similarities outlined above, we see important distinctions between the signature pedagogies. For example, (auto)biographical pedagogies tend to encourage practitioners to broaden their perspectives by considering experiences and stories beyond their own. Even when the focus of an (auto)biographical pedagogy is self, there tends to be an emphasis on considering the impact personal experiences may have on interactions with others. Experiential pedagogies tend to focus predominantly on providing hands-on teaching-learning experiences and, in this way, placing a greater emphasis on the self as teacher. Pedagogies of professional learning offer a unique opportunity in that they tend to be inquiry-based approaches with a strong collaborative element. Given the distinctions in relation to both approach and desired outcome of each signature pedagogy, alongside the acknowledged similarities, we argue that effective teacher education in PE will look to integrate a variety of signature pedagogies and to consider how they might be used in concert to support teachers' learning and development, while tailoring them to the local context and specific and unique needs of individual teachers.

### *The distinct nature of a pedagogy of teacher education in physical education*

Returning to Shulman's (2005) notion of signature pedagogies as the forms of teaching that leap to mind when thinking of the education of members of a particular profession, we wonder what makes a pedagogy of teacher education in PE distinct from a pedagogy of teacher education more broadly (Loughran 2006). Indeed, (auto)biographical and experiential pedagogies have been used in teacher education programs across subject areas and international contexts (e.g. Fischetti et al. 2022; Harfitt and Chow 2018; Kelchtermans 2014). Further, research on CPD suggests that characteristics of effective approaches to teachers' professional learning are also consistent across subject areas

(e.g. Darling-Hammond, Hyler, and Gardner 2017; Zepeda 2019). However, we agree with the assertion that a pedagogy of teacher education in PE, as distinct from a pedagogy of teacher education, is needed. This review of literature has highlighted how signature pedagogies of teacher education in PE are, of necessity, applied in distinct ways and/or toward distinct ends within the context of PE. For instance, while (auto)biographical pedagogies, such as narratives, vignettes, and reflective journaling, might be used across teacher education contexts, there tends to be a strong emphasis on using these pedagogical approaches to lead teachers to consider their own and others' *embodied* experiences and how these might vary for particular groups and individuals (e.g. related to [dis]ability, ethnic background, gender) in the context of teacher education in PE. Concerning experiential pedagogies, there is a significant emphasis on enabling teachers to move their bodies in the same ways they expect their future students to. This approach allows them to personally encounter the sensations, emotions, and experiences associated with an embodied PE experience. This emphasis on understanding and experiencing the embodied nature of learning in PE is arguably (and necessarily) distinct from how teachers are prepared or supported for teaching maths, sciences, and languages, for example. In this way, the present review reinforces the importance of a distinct pedagogy of teacher education in PE. Although signature pedagogies identified here (including their surface, deep, and implicit structures) may have broad applicability across various teacher education contexts, programs, and subject areas, we emphasise the necessity and value of carefully considering alignment with the specific context, purpose, and content to which they will be applied.

## Conclusions

We recognize that there may be additional and/or different conceptualizations or groupings of signature pedagogies in the field of teacher education in PE beyond those we have presented in this scoping review. Our aim has been to present a shared language and set of ideas rather than to outline a prescriptive or exclusive method or approach for facilitating learning experiences for PSTs, ISTs, and teacher educators in PE. We also acknowledge that, while this provides some insight into pedagogies that may support learning, this is not to suggest that these pedagogies are inherently beneficial. Indeed, there is a need to consider the context and application of signature pedagogies and the *quality* of the experience and types of practices that are being reproduced in and through them (Chiva-Bartoll et al. 2020). Through our use of several examples from the literature (and inclusion of Appendix A), we aim to highlight the vast use of these pedagogies and what might be the common thread(s) between/amongst them for the reader's consideration. We also point to the need for the application of signature pedagogies (as the 'how' of teacher education in PE) to be intentionally connected to and derived from the purposes (i.e. the 'why') of teacher education in PE. In line with Biesta (2013), we suggest that the question of purpose must be pre-eminent in decisions concerning both content and pedagogy in teacher education in PE.

In terms of what might be missing from the review, as can be seen in Appendix A, there were a small selection of articles included in the review which we did not see as fitting into any of the three groupings of signature pedagogies (e.g. Felis-Anaya et al. 2018; Lynch and Curtner-Smith 2020). Several of these pedagogies were positioned as 'transformative' or 'critical' pedagogies. At times, transformative/ critical pedagogies were included in one of the three categories (for example, the use of debates or fictional tale toward transformative objectives). Yet, it is noteworthy that there seems to be an emerging emphasis on other innovative pedagogies which were not captured in our groupings of the signature pedagogies. These were far less prevalent than the three primary groups, and thus did not constitute a signature (i.e. pervasive) pedagogy in our view. However, we highlight that this may be an emerging or developing grouping of signature pedagogies of teacher education in PE in the twenty-first century, perhaps in response to changes in understandings of the purposes (i.e. the *why*) of teacher education in PE in recent years.

In this review, apart from highlighting some of the purported benefits as they relate to the deep and implicit structures of the pedagogies, we have given no attention to research concerning the

‘quality’ or potential outcomes of these pedagogies in an empirical sense. Further, it is beyond the scope of this review to consider ‘signature’ pedagogies of school-based PE, which arguably form part of the content of PE-ITE and PE-CPD. We suggest further research may seek to review the literature on (a) the impact of the signature pedagogies presented here on the learning of PSTs, ISTs and teacher educators, and (b) the signature pedagogies of school PE, and their impact on students learning.

This study offers a preliminary shared language of teacher education pedagogies in the field of PE and is thus intended to open a dialogue on the topic. While this review represents an initial step in addressing a gap in the literature by exploring and articulating teacher education pedagogies in PE (Hordvik, MacPhail, and Ronglan 2020; Parker, Patton, and O’Sullivan 2016), there remains a need to analyse their use across teacher education contexts (O’Sullivan 2018; Tannehill et al. 2021). Importantly, we acknowledge that there is a tension between developing a shared language to enhance a sense of coherence in teacher education in PE while simultaneously acknowledging the need for flexibility in applying signature pedagogies in diverse contexts. We believe the categories of signature pedagogies presented here are broad enough to afford such a balance – promoting coherence without calling for prescriptive practice. However, we suggest there is a need to consider how this shared language might inform a more intentional practice of these pedagogies within and across teacher education contexts in ways that might ensure more authentic, transformative, and equitable teacher education practices for PSTs, ISTs, teacher educators, and students in PE in ways that are sensitive to and supportive of local context and culture.

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