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Unveiling the reflective path of pre-service teachers: A year-long action research study in Physical Education settings

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*‘There will come a time when you believe everything is finished
that will be the beginning.’*

Louis L'Amour

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À minha avó e ao meu filho. Pela sabedoria pura.

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Resumo

A presente tese teve como objetivo central investigar como os estudantes-estagiários (EEs) desenvolveram a reflexão crítica durante o seu estágio profissional em Educação Física, através um desenho longitudinal de investigação-ação (IA), bem como o papel de um facilitador externo (FE) neste processo. Os participantes incluíram seis EEs e um FE que assumiu o duplo papel de FE e investigador. Foi utilizada uma metodologia eclética para a recolha de dados que integrou entrevista de grupo focal, diário reflexivo escrito e observação participante analisados através de Análise Temática. Esta abordagem permitiu ao FE intervir de forma intencional, cíclica, contextualizada e interativa, adaptando o seu suporte às necessidades específicas dos EEs, ao longo do tempo. Este estudo evidenciou que a desconstrução e a resignificação sobre os principais conceitos alocados à reflexão, por parte dos EEs, a criação de um ambiente amistoso e convidativo ao estabelecimento de conversas reflexivas e, ainda, a implementação de estratégias pedagógicas (i.e., o questionamento, a observação de pares e a reflexão escrita) foram elementos catalisadores do desenvolvimento da reflexão crítica nos EEs. Mormente, a aplicação do questionamento capacitou os EEs a pensar sobre múltiplas perspetivas, enquanto a combinação da observação de pares com a reflexão escrita fortaleceu a capacidade de refletirem em relação a diferentes momentos e a considerarem a autoconsciência no processo de reflexão. Tal esforço, permitiu-lhes adotar uma perspetiva crítica na análise de si próprios e nos problemas emergentes da própria prática. Na medida em que a capacidade de reflexão é essencial para o desenvolvimento profissional do professor, os resultados sugerem a necessidade de se desenvolver de forma explícita e estruturada a reflexão nos programas de formação de professores, porquanto serão estimulados a interpretar a prática ao longo do tempo, através de um processo de reflexão intrinsecamente percebido e assumido.

PALAVRAS-CHAVE: REFLEXÃO, ESTUDANTES-ESTAGIÁRIOS, FORMAÇÃO DE PROFESSORES DE EDUCAÇÃO FÍSICA, INVESTIGAÇÃO-AÇÃO, LONGITUDINAL, QUALITATIVO.

Abstract

The main aim of this thesis was to investigate how pre-service teachers (PSTs) developed critical reflection during their practicum in Physical Education, using a longitudinal action-research (AR) design, and to examine the role of an external facilitator (EF) in this process. Participants were six PSTs and one EF who took on the dual role of EF and researcher. An eclectic methodology was used for data collection, integrating focus group interviews, written reflective diaries, and participant observation, which were analyzed through Thematic Analysis. This approach allowed the EF to intervene in an intentional, cyclical, contextualized, and interactive fashion, adapting their support to the specific needs of the PSTs over time. The study highlighted that deconstructing and re-signifying the main concepts allocated to reflection by the PSTs, creating a friendly and inviting environment for the establishment of reflective conversations, and implementing pedagogical strategies (i.e., questioning, peer observation, and written reflection) were catalyst for the development of critical reflection in the PSTs. Particularly, the use of questioning enabled the PSTs to consider multiple perspectives, while combining peer observation with written reflection strengthened their ability to reflect on different moments and incorporate self-awareness into the reflection process. This effort allowed them to adopt a critical perspective in analyzing themselves and the emerging problems of their own practice. As the capacity for reflection is essential for teachers' professional development, the results suggest the need for teacher education programs to explicitly and structurally develop reflective skills, as they will be stimulated to interpret practice over time, through a process of reflection that is intrinsically perceived and assumed.

KEYWORDS: REFLECTION, PRE-SERVICE TEACHERS, PHYSICAL EDUCATION
TEACHER EDUCATION, ACTION-RESEARCH, LONGITUDINAL, QUALITATIVE.

List of Abbreviations

PE – Physical Education

PETE – Physical Education Teacher Education

PSTs – Pre-service Teachers

AR – Action Research

RJs – Reflective Journals

FGs – Focus Groups

EF – External Facilitator

POs – Participant Observations

CT – Cooperating Teacher

WR – Written reflection

Chapter I – Introduction

1.1 Rationale

In an era of continuous social transformation and an increasing focus on holistic education, Physical Education Teacher Education (PETE) faces a significant challenge: preparing pre-service teachers (PSTs) to go beyond basic technical proficiency. This form of teacher education is designed to support individuals in fulfilling various life roles, with the objective of cultivating responsible, autonomous, and competent citizens capable of engaging critically and creatively within their social environments (Cronin et al., 2020). Consequently, it is vital for PSTs to be adaptable, critically aware and prepared to meet the complex needs of their students (Østergaard, 2019). To address these demands effectively, teachers must cultivate a reflective mindset, a key element of PETE. This mindset is essential for improving their ability to integrate critical thinking into their teaching practice. While reflection is recognized as a fundamental aspect of PETE, particularly in challenging existing beliefs and experiences, studies show that many PSTs face considerable difficulties in effectively reflecting on their practices.

Looking forward, the primary focus will be on highlighting the key aspects that research has revealed, particularly regarding equipping PSTs with the skills necessary for critical reflection.

Starting point: What does it mean to reflect, and why is it so important in teacher education?

In today's teacher education landscape, the cultivation of reflection as a central skill for professional excellence has not only gained prominence but has also garnered sustained attention, profoundly influencing academic research in the field over the past nine decades (Clarà, 2015). This complex concept is deeply rooted in robust theoretical frameworks, largely credited to the seminal works of Dewey, who defined reflection as *'the active, persistent, and careful consideration of any belief or supposed form of knowledge in the light of the grounds that support it and the further conclusions to which it tends'* (1933a, p. 9). Dewey conceptualized reflection as a deliberate and focused mental activity, distinct from simply 'daydreaming'. It involves a coherent sequence of thoughts

leading to a well-reasoned conclusion, a notion central to Dewey's perspective. Nowadays, this foundational understanding has been enriched and diversified through ongoing educational research, giving rise to diverse interpretations of what reflection that continue to evolve dynamically (Ruffinelli et al., 2020).

Boyd and Fales (1983) extended the concept reflection from being purely an internal process to include its social and collaborative aspects. Thus, reflection is recognized not just as an individual cognitive effort but also as a shared enterprise enriched by various perspectives and approaches. The critical dimension of reflection, which involves scrutinizing our interpretive efforts to understand experiences, was notably emphasized by Mezirow (1990b). Moon (2007) added further nuance by portraying reflection as a mental exercise in solving complex, unstructured problems within dynamic and ever-changing contexts.

Most recently, Marshall (2019) in a systematic review, offered a contemporary definition of reflection as 'a careful examination and aggregation of ideas to generate new insights through ongoing cycles of expression and re-evaluation' (p. 411). Marshall views this process as dynamic encompassing cognitive, integrative, iterative, and active elements.

In summary, these varied perspectives underline the intricate and multifaceted nature of reflection, emphasizing its transformative and continuous nature across cognitive, social, and critical dimensions. This understanding is particularly critical in PETE, as teachers often lean towards a traditional approach that emphasizes replication rather than innovation (Tinning, 2016). This tendency results from a lack of reflective thinking that can encourage PSTs to interpret their practical experiences and discern areas for improvement in their future actions (Peralta et al., 2021). To understand current practices better, it is crucial to examine field experiences, which offer PSTs real-world experiences that can be enhanced through reflective practice.

Interpreting Challenges in Practicum: Fostering Complexity and Reflection of PSTs

It is essential to acknowledge that the journey to becoming a teacher is

deeply rooted in contextual practice, entwined with authentic teaching and learning experiences that promote inclusion and engagement. For PSTs, reflecting on these experiences is fundamental, as it provides insights into their cognitive processes and teaching methods. Reflection thrives not in isolation but within the practical contexts they will encounter (Sicora, 2019). Therefore, by bridging theoretical knowledge with its application in the nuanced realities of the classroom, which includes trial and error, PSTs can develop their own reflective practice (Schön, 1983).

This dynamic approach, blending analysis and reflection, equips PSTs for the inherent unpredictability of teaching, fostering resilience and adaptability (Attard & Armour, 2005; Pike, 2015). Such an endeavor transforms them into open-minded educators who proactively shape their learning journeys and deepen their understanding of reflection (Dixon et al., 2022). The importance of this approach is particularly pronounced in PE practicum, which is characterized by complexity, ambiguity, non-linearity (Minott, 2019; Mulryan-Kyne, 2021), and unpredictability (Ward et al., 2014). Hence, PSTs must critically examine their beliefs about the subject and deconstruct their prior experiences (Fletcher & Kosnik, 2016).

Therefore, PSTs need to enhance their self-awareness and understand how their solutions relate to other ideas and past experiences, thus promoting professional development. Critical reflection aids this process, enabling PSTs to convert practical experiences into personal insights (Schön, 1995), examine their belief systems (Larrivee, 2008), and move away from prescriptive teaching methods (Aartun et al., 2022). However, critical reflection can be quite demanding, especially for PSTs whose beliefs, assumptions, and values are continually tested (Larrivee, 2008). Studies show that in PETE programs, PSTs often engage in surface-level reflection, focusing on the factual and descriptive aspects (Standal & Moe, 2013; Zhu, 2011), which constrains their ability to navigate the complexities of PE practicum practices effectively.

Navigating the Complexity: The Hurdles and Hopes of Implementing Reflection in PETE and Current Challenges

In addressing the complex challenges of practicum settings, critical reflection serves as a pivotal tool for PSTs in their development as reflective practitioners. This ongoing process of evolution enables them to assess and select from a range of options and responses (Larrivee, 2008). However, many current teacher education programs adopt a 'quick-fix' approach, emphasizing surface-level strategies that focus predominantly on the technical aspects of teaching (Moody, 2009; Nagle, 2008). This approach often neglects the development of critical reflection, which is necessary for PSTs to experience doubt, enabling them to think from multiple perspectives and convert their acquired knowledge into personal understanding (Entwistle & Entwistle, 1991; Mesquita et al., 2014). Despite its recognized importance, many PSTs find it difficult to comprehend the concept of reflection and to apply it effectively in their teaching journey (Minott, 2019; Mulryan-Kyne, 2021). The challenges in reflection often stem from PSTs' superficial understanding of it as a routine aspect of their profession (Capel, 2007), often favoring content knowledge over pedagogical depth. This often results in a lack of profound interpretation (Moore-Russo & Wilsey, 2014; Standal & Moe, 2013). Consequently, there is a need for PETE programs to evolve to transform how PSTs adapt and address the real-world complexities of practicum, thus fostering a more effective, adaptable, and reflective workforce.

Therefore, incorporating insights from practicum experiences into reflective process could offer guidance in addressing future challenges (Larrivee, 2008). This hands-on involvement promotes self-regulation and cultivates the ability to view issues from multiple perspectives (Gomes et al., 2018; Miller, 2022). To ensure critical reflection is truly meaningful, it is essential to adopt a 'flexible long-term' rather than a 'quick-fix' approach. Such an approach should encompass both the content and the process of reflection, potentially playing a pivotal role in helping PSTs to manage the complexities of their teaching experiences (Liu, 2015), and should involve understanding the fundamental nature of reflection, identifying suitable contexts for its implementation,

establishing clear objectives, and delineating specific methods for its effective development.

Although current research emphasizes the benefits of reflective practice during the practicum, it has mainly concentrated on the intersection of theory and practice (Prado et al., 2019; Saiz-Linares & Susinos-Rada, 2020) or on the topics PSTs believe they should reflect upon (Østerlie & Kristensen, 2023). This situation highlights the urgent need for studies that explore how PSTs understand and integrate theoretical concepts of reflection into their daily practicum experiences. Such research would enable them to tackle challenges more effectively and improve their critical reflection skills.

Alongside the ambiguity, the practicum of PSTs is characterized by tension and evaluative pressure (De Martin-Silva & Mesquita, 2016), involving continuous assessment that results in overwhelm, stress, and vulnerability (Gray et al., 2017). Hence, cultivating reflection in PSTs requires a receptive mindset that enables individual and collective self-discovery, exposure, and critique (L. Foong et al., 2018).

To enable PSTs to confidently tackle teaching challenges (Moussaid & Zerhouni, 2017), the practicum should offer a secure, supportive, and motivating environment. This setting encourages PSTs to fully embrace the vulnerability that is inherent in reflective processes (Béres, 2019). Such introspection promotes an open mindset in PSTs, leading to self-exploration and rigorous evaluation of their educational approaches (Foong et al., 2018). Despite recognizing reflection as an emotional process, there remains a research gap concerning how PSTs' concerns and needs are addressed during the development of their reflection in practicum settings.

To address this issue, fostering a caring relationship can be helpful, as it can create a supportive environment that addresses the emotional intricacies PSTs encounter during their practicum (Darder, 2017). A caring environment nurtures trust and emotional safety that allows PSTs to acknowledge their vulnerabilities, critically evaluate their experiences, and engage in deeper, transformative reflection (Lugueti et al., 2019; Moffatt et al., 2016). The importance of caring in teacher education is well-established, with research

focusing on its practices (Simel Pranjic, 2021), elements (Barrow, 2015), and relationship-building aspects (Moen et al., 2020). However, there is still limited research on how caring integrates with and impacts the processes of reflection, particularly in the PETE context.

As PSTs develop an understanding of the meanings of reflection and experience support in a caring relationship, they also need pedagogical strategies to interpret their practice effectively on their journey to becoming reflective practitioners. Although the importance of critical reflection in PETE is widely acknowledged, there is a significant gap in the development and implementation of such pedagogical strategies within PETE programs.

In this context, questioning has emerged as a key pedagogical strategy to enhance the reflective process. This approach is particularly effective when personalized and tailored to specific contexts, under the guidance of teacher educators. Such a strategy not only involves PSTs in a deeper reflective process but is also essential for cultivating a more profound understanding of reflective practice (Tur et al., 2016). This approach encourages PSTs to move beyond a binary 'right vs. wrong' mindset toward a relativist perspective that values diverse solutions. This shift broadens their cognitive, interpretative, and pedagogical skills, which in turn, contributes to the development of critical reflection (Brookfield, 1987; Sheridan & Mungai, 2021). However, research suggests that questioning during practicum often fails to stimulate various types of questioning, potentially restricting reflective development. Consequently, there is a clear need for research exploring how tailored questioning can be effectively integrated into practicum experiences, customized to the unique contexts and challenges that PSTs face.

Another vital aspect in developing critical reflection for PSTs is capturing the entirety of their practice. This includes not only tailored questioning strategies but also the integration of reflective practice at various stages of their pedagogical interventions (Miller, 2022). The temporal dynamics of reflection, including 'reflection-in-action' (reflecting during the action or event), 'reflection-on-action' (reflecting on past actions), and 'reflection on reflection-in-action' (reflecting on the process of reflecting during the action) are crucial. These practices enable

PSTs to adjust their teaching strategies in real-time, effectively addressing classroom challenges and guiding future pedagogical decisions. While 'reflection-on-action' is widely researched and practiced by teachers, there is a notable gap in studies on 'reflection-in-action' and 'reflection on reflection-in-action' (Umutlu & Kim, 2020). These less explored areas are critical, as they prevent PSTs from becoming overwhelmed by classroom complexities and enhance the depth and breadth of their reflective practice (Cavanagh & McMaster, 2015b).

Given this context, there exists a significant gap in the literature concerning how these temporal dynamics can be effectively fostered to enhance PSTs' reflective capabilities. Investigating this area could yield valuable insights into how PETE programs might be adapted to cultivate these essential skills in PSTs, thereby preparing them for the diverse challenges of real-world teaching scenarios. Indeed, this multidimensional approach to fostering reflection equips PSTs with vital critical thinking skills. These skills are crucial for understanding and adeptly navigating the spontaneous and unpredictable demands of the teaching profession (Ravanal Moreno et al., 2021).

The Role of Support in Reflection and Implementation of Intervention Methodologies for PSTs

Current PETE programs require structured support, including emotional, cognitive, and practical aspects, to effectively navigate the complexities of practicum and foster deep understanding and application of the reflection process (Larrivee, 2008; Schön, 1987; Vygotsky, 1978). However, there is a notable deficiency in the support mechanisms of existing PETE programs, often leaving PSTs to confront these challenges alone (Ravanal Moreno et al., 2021; Umutlu & Kim, 2020). While these programs aim to promote reflection, they typically lack a structured framework for guiding PSTs in this process (Zhu, 2011). This absence can lead to superficial engagement with the reflective process (Minott, 2019; Mulryan-Kyne, 2021).

To meet the intricate demands of critical reflection and practicum, PETE programs should offer continuous instruction, guidance, and targeted practice that 'explicitly, directly, thoughtfully, and patiently' supports the development of

PSTs' reflective abilities (Russell, 2005, p. 203). This involves bridging theory and practice (Harford & MacRuairc, 2008; Winkel et al., 2017) and creating a supportive environment that encourages collaborative reflection (Jones & Ryan, 2014). Supervisors should act as facilitators, engaging in meaningful dialogue and active listening, thus enabling PSTs to delve into the complexities of their teaching practices (Farias et al., 2018), which in turn supports critical decision-making (Marshall et al., 2022). Facilitators can assist PSTs in deconstructing reflection (Gonçalves et al., 2022) and examining experiences from various perspectives (Verwoerd et al., 2020), thereby making the support more adaptable to the unique aspects of the teaching-learning context and the needs of PSTs. However, providing support that is personalized and tailored to the distinct characteristics of the teaching-learning context and the requirements of PSTs demands a flexible approach.

Therefore, to effectively modify, structure, and thoroughly comprehend this dynamic, employing interventional research designs that monitor changes over time is crucial. This approach allows for an in-depth understanding of how PSTs' reflective capacities can be nurtured during their practicum. For instance, the Action Research (AR) design, characterized by its deliberate, interactive, cyclical, contextual, and interventionist nature (Lewin, 1946), provides a comprehensive framework for monitoring and responding to the needs and challenges of PSTs throughout their practicum.

AR designs are particularly effective in capturing the fluidity of PSTs' reflective thinking and professional growth. They allow for the real-time adaptation of support mechanisms and interventions to address emerging challenges and capitalize on opportunities during PSTs' developmental journey (Bjørke et al., 2022). Although research emphasizes AR in PE as a crucial tool for teachers to evaluate and refine their pedagogical approaches (Casey, 2018), there is a notable gap in literature regarding the use of interventional research designs. This lack of focus on interventional methodologies constrains our understanding of the development of PSTs' reflective abilities, limiting deeper insights into this critical aspect of teacher education. Additionally, there is a significant lack of research on providing continuous, consistent support

throughout the AR process in PETE programs. Therefore, interventional research methods that offer personalized support are crucial for a comprehensive understanding and evaluation of the complex evolution of PSTs' reflective skills throughout their training, offering valuable insights to enhance PETE programs.

1.2. Research problems and aims

Becoming a PE teacher is a complex and multifaceted process, characterized by specific contextual challenges and ambiguities (Alves et al., 2019). The practicum provides PSTs with a valuable opportunity to develop reflective practices. These practices are essential for interpreting and addressing the challenges encountered during this phase.

However, PSTs often struggle to enhance their reflective skills, particularly in understanding the essence of reflection (Minott, 2019; Mulryan-Kyne, 2021). Current research tends to overlook how PSTs understand the process of reflection and how this understanding could be leveraged to strengthen their reflective capacity. For these reasons, it is crucial for PSTs to comprehend the concept of reflection thoroughly. This awareness is key to their ability to act intentionally in their practice and to precisely identify their personal challenges, struggles, or needs.

To foster this understanding, PSTs must be willing to embrace vulnerability and fully engage with the reflective process. However, the PETE practicum environment, often characterized by intense assessment pressures (Walters et al., 2023), should instead promote a culture of safety and openness. This environment would allow PSTs to express their vulnerabilities without fear, which is crucial for confronting real challenges and critically evaluating their experiences (Béres, 2019) - an aspect often neglected in PETE research.

By understanding the concept of reflection and creating an environment conducive to its growth, PSTs can achieve critical reflection. In this regard, the implementation of specific pedagogical strategies is essential. These strategies enable PSTs to analyze their practice beyond a simple binary right or wrong (Tur et al., 2016), provide them with sufficient time for in-depth reflection (Crawford et al., 2012), and enhance their self-awareness (Korucu Kis & Kartal, 2019).

The development of critical reflection among PSTs necessitates that they deconstruct their practice by reflecting at different times: during, upon, and in reflection-in-action (Miller, 2022). However, much existing research predominantly focuses on reflection-on-action, thereby overlooking the rich temporal dynamics inherent in the reflective process. By engaging in this dynamic process, PSTs can view their practice from multiple perspectives, leading to a more comprehensive understanding (Cavanagh & McMaster, 2015). Nevertheless, a significant research gap remains in PETE regarding the exploration of the methods involved in the developing critical reflection during PSTs' practicum. This gap limits a deeper understanding of its complexities and its implications for educational practice.

To fully understand and encourage the reflective practices of PSTs, it is essential to utilize research designs that explore, support and monitor their evolving experiences. This approach is crucial for cultivating authentic critical reflection that addresses the specific challenges PSTs encounter during their practicum.

Therefore, the central aim of the study was to investigate the development of PSTs' critical reflection during their PE practicum using a long-term AR design. Furthermore, the study aimed to examine the role of an external facilitator (EF) in enhancing PSTs' critical reflection throughout their PE practicum. Given the overarching aim of the study, the following specific objectives were established:

1. To review existing knowledge on reflective strategies used by PE teachers, how they have been studied, and how such strategies can be further developed and refined in PETE to guide future research and practice.
2. To understand the concept of reflection in PSTs and its value, investigate the role of critical reflection in developing PSTs into reflective practitioners and examine the pedagogical tools for developing their critical reflection.
3. To explore how PSTs deconstruct their initial reflections recontextualize their understanding based on challenges encountered in real-world practicum settings.

4. To explore how an EF's caring approach can assist in developing strategies and creating conditions that enhance and deepen PSTs' reflection on their pedagogical practice.
5. To explore the development of critical reflection in PSTs through the strategic use of various question types by an EF.
6. To explore the impact of peer observation combined with written reflection on the development of the temporal dynamics of PSTs' reflection.

1.3. Thesis structure

This dissertation adheres to the presentation and writing standards of the Faculty of Sport, University of Porto (FADEUP), adhering specifically to the guidelines of the Scandinavian model. The choice of this model was motivated by its familiarity, its effectiveness in developing domain-specific skills, and its applicability to scientific research. The process of scientific publishing, encompassing everything from initial writing to peer review and eventual publication, has been instrumental in promoting critical thinking and encouraging diverse perspectives. This approach significantly enhances the quality of the research presented.

The dissertation is structured into various chapters and scholarly papers, each contributing to the overarching project goals. This structure ensures that the work meets the standards required for publication in internationally recognized, peer-reviewed journals with an impact factor. In summary, this dissertation includes:

Chapter I serves as the introductory segment of the dissertation. It delineates the foundational theories that underpin the research, emphasizing both the significance and the innovative contributions of the research topic. This chapter effectively synthesizes existing literature in the academic field to contextualize the study. Furthermore, it clearly outlines the overarching objectives and specific research goals, and provides a detailed overview of the thesis' structure.

Chapter II offers an in-depth synthesis of the theoretical foundations of the dissertation. It encompasses both a systematic review and a theoretical essay.

This chapter aims to integrate relevant existing theories, thereby presenting a comprehensive and integrated perspective of the academic landscape as it relates to the research topic.

The first theoretical article, titled '*The Development of Reflective Skills in Physical Education Teacher Education: A Systematic Review*', seeks to deliver a comprehensive analysis of research on the development of reflective skills in teachers within the context of PETE. It focuses on identifying the most prominent strategies that have been developed for this purpose. Additionally, this article provides a detailed analysis of the methodological characteristics of existing research and aims to uncover the primary challenges faced by teachers when implementing these strategies. Specifically, it synthesizes information about the contexts, designs and main findings of scientific studies in PE from January 2000 to March 2021.

The second theoretical article, entitled '*A Step Forward on the Journey of Pre-Service Teachers Becoming Reflective Practitioners*', aims to elucidate the role of reflection in the development of PSTs. It offers an in-depth examination of pedagogical practice interpretation, emphasizing the importance of reflective practice and the crucial role of critical reflection. This theoretical essay delves into the intricate process of growth and maturation within the complex realm of practice. It also presents pedagogical tools designed to foster critical reflection among pre-service teachers. This approach aims to facilitate their journey towards knowledge and provide practical guidelines for PE PSTs and teacher educators. The conclusions gleaned from these two theoretical articles play a pivotal role in establishing a robust theoretical foundation for the empirical studies included in this thesis.

Chapter III presents the empirical portion of the thesis, comprising four qualitative studies. The first study, titled '*Diving into Real-World Practicum in Physical Education: Deconstructing and Re-signifying Pre-service Teachers' Reflection*', explores how PSTs deconstruct and reinterpret their initial reflections in response to challenges encountered during real-world practicum experiences. Additionally, this study examines the role of the facilitator in supporting the evolution of PSTs' reflective processes over time.

The second study, *'How Can a Facilitator's Caring Approach Trigger and Deepen Pre-Service Teachers' Reflection on Their Pedagogical Practice?'*, conducted within the PETE context over the course of a year, investigates the impact of a facilitator's caring approach in enhancing and deepening PSTs' reflective practices.

The third study, titled *'How Can Tailored Questions Foster Reflection in Pre-Service Teachers?'*, focuses on the promotion of critical reflection among PSTs through the use of tailored questions posed by educational facilitators.

The fourth and final study in Chapter III, titled *'Nurturing the Temporal Dynamic of Reflection Among Pre-Service Teachers: The Contribution of Peer Observation and Written Reflection'*, explores how peer observation and written reflection aid in the development of PSTs' reflective processes over time.

Chapter IV provides a concluding analysis. It discusses the theoretical concepts addressed and validates them through key insights derived from each empirical study. This chapter offers a summary and synthesis of the main findings, along with their pedagogical implications and recommendations for future academic research.

References are included at the end of each chapter. Furthermore, bibliographic references for each article are provided at the conclusion of the respective study, conforming to the citation standards of the relevant journals. The complete structure of the thesis is outlined in Table 1 for clarity.

Table 1. Synopsis of the structure, contents and studies included in the present dissertation.

Chapter I	Introduction
	Theoretical framework, pertinence of the investigation, research questions and purposes as well as the structure of the thesis.
Chapter II	Theoretical Articles
	Azevedo, E., Araújo, R., & Mesquita, I. <i>The Development of Reflective Skills in Physical Education Teacher Education: A Systematic Review</i>

	https://doi.org/10.47197/retos.v46.94080 Published in <i>Retos</i> Q3 - JCI Quartile
	Azevedo, E., Ramos, A., Araújo, R., & Mesquita, I. <i>A Step Forward on the Journey of Pre-Service Teachers Becoming Reflective Practitioners</i> Publication accepted by the <i>Revista Portuguesa de Ciências do Desporto</i> (FADEUP)
Chapter III	Empirical Articles
Empirical Study 1	Azevedo, E., Ramos, A., Valério, C., Araújo, R., & Mesquita, I. <i>Diving into Real-World Practicum in Physical Education: Deconstructing and Re-signifying Pre-service Teachers' Reflections</i> Under revision: <i>Education Sciences</i> Q1 - JCI Quartile
Empirical Study 2	Azevedo, E., Valério, C., Araújo, R., Ramos, A., & Mesquita, I. How Can a Facilitator's Caring Approach Trigger and Deepen Pre-Service Teachers https://doi.org/10.1080/14623943.2023.2264213 Published in <i>Reflective Practice</i> Q1 - SJR Quartile
Empirical Study 3	Azevedo, E., Ramos, A., Araújo, R., Valério, C., & Mesquita, I. How Can Tailored Questions Foster Reflection in Pre-Service Teachers? A Year-Long Action Research Study https://doi.org/10.1177/1356336X231217405 Publication accepted <i>European Physical Education Review</i> Q1 - SJR Quartile
Empirical Study 4	Nurturing the Temporal Dynamic of Reflection Among Pre-Service Teachers: The Contribution of Peer Observation and Written Reflection Azevedo, E., Ramos, A., Araújo, R., Valério, C., & Mesquita, I. https://doi.org/10.18662/rrem/15.4/807 Published in <i>Revista Romaneasca pentru Educatie Multidimensionala</i>

	Q2 - JCI Quartile
Chapter IV	Final considerations
	Overview and a synopsis of the main findings, practical applications for PE teachers, and suggestions for future scientific research.

1.4. References

- Aartun, I., Walseth, K., Standal, Ø. F., & Kirk, D. (2022, 2022/01/02). Pedagogies of embodiment in physical education – a literature review. *Sport, Education and Society*, 27(1), 1-13. <https://doi.org/10.1080/13573322.2020.1821182>
- Alves, M., MacPhail, A., Queirós, P., & Batista, P. (2019). Becoming a physical education teacher during formalised school placement: A rollercoaster of emotions. *European Physical Education Review*, 25(3), 893-909.
- Boyd, E. M., & Fales, A. W. (1983). Reflective learning: Key to learning from experience. *Journal of humanistic psychology*, 23(2), 99-117.
- Capel, S. (2007). Moving beyond physical education subject knowledge to develop knowledgeable teachers of the subject. *The Curriculum Journal*, 18(4), CURJ09585170701687936. <https://doi.org/https://doi.org/10.1080/09585170701687936>
- Clarà, M. (2015). What is reflection? Looking for clarity in an ambiguous notion. *Journal of Teacher Education*, 66(3), 261-271. <https://doi.org/https://doi.org/10.1177/0022487114552028>
- Crawford, S., O'Reilly, R., & Luttrell, S. (2012). Assessing the effects of integrating the reflective framework for teaching in physical education (RFTPE) on the teaching and learning of undergraduate sport studies and physical education students. *Reflective Practice*, 13(1), 115-129.
- Cronin, L., Marchant, D., Johnson, L., Huntley, E., Kosteli, M. C., Varga, J., & Ellison, P. (2020, 2020/07/01/). Life skills development in physical education: A self-determination theory-based investigation across the school term. *Psychology of sport and exercise*, 49, 101711. <https://doi.org/https://doi.org/10.1016/j.psychsport.2020.101711>
- Dewey, J. (1933). *How we think*. Heath. <http://search.ebscohost.com/login.aspx?direct=true&AuthType=ip,uid&db=psych&AN=1934-00090-000&lang=pt-pt&site=ehost-live&scope=site>
- Entwistle, & Entwistle. (1991). Contrasting forms of understanding for degree

- examinations: the student experience and its implications. *Higher Education*, 22, 205-227.
- Fletcher, T., & Kosnik, C. (2016). Pre-service primary teachers negotiating physical education identities during the practicum. *Education 3-13*, 44(5), 556-565.
- Gomes, R., Jones, R. L., Batista, P., & Mesquita, I. (2018, 2018/01/02). Latent learning in the work place: the placement experiences of student-coaches. *Sport, Education and Society*, 23(1), 68-81. <https://doi.org/https://doi.org/10.1080/13573322.2016.1141287>
- Korucu Kis, S., & Kartal, G. (2019). No pain no gain: reflections on the promises and challenges of embedding reflective practices in large classes. *Reflective Practice*, 20(5), 637-653. <https://doi.org/https://doi.org/10.1080/14623943.2019.1651715>
- Larrivee, B. (2008). Meeting the challenge of preparing reflective practitioners. *The New Educator*, 4(2), 87-106. <https://doi.org/https://doi.org/10.1080/15476880802014132>
- Marshall, T. (2019). The concept of reflection: a systematic review and thematic synthesis across professional contexts. *Reflective Practice*, 20(3), 396-415. <https://doi.org/https://doi.org/10.1080/14623943.2019.1622520>
- Mesquita, I., Ribeiro, J., Santos, S., & Morgan, K. (2014). Coach Learning and Coach Education: Portuguese Expert Coaches' Perspective. *Sport Psychologist*, 28(2), 124-136. <http://search.ebscohost.com/login.aspx?direct=true&db=s3h&AN=97262526&lang=pt-br&site=ehost-live>
- Mezirow, J. (1990). How critical reflection triggers transformative learning. *Fostering critical reflection in adulthood*, 1(20), 1-6.
- Miller, P. E. (2022). Reflection-in-action: the use of student audio recordings. *Social Work Education*, 1-15. <https://doi.org/https://doi.org/10.1080/02615479.2022.2031961>
- Minott, M. (2019). Reflective teaching, inclusive teaching and the teacher's tasks in the inclusive classroom: A literary investigation. *British Journal of Special Education*, 46(2), 226-238. <https://doi.org/https://doi.org/10.1111/1467-8578.12260>
- Moon. (2007). *Critical thinking: An exploration of theory and practice*. Routledge.
- Moore-Russo, D. A., & Wilsey, J. N. (2014). Delving into the meaning of productive reflection: A study of future teachers' reflections on representations of teaching. *Teaching and Teacher Education*, 37, 76-90.

<https://doi.org/https://doi.org/10.1016/j.tate.2013.10.002>

- Mulryan-Kyne, C. (2021). Supporting reflection and reflective practice in an initial teacher education programme: An exploratory study. *European Journal of Teacher Education*, 44(4), 502-519. <https://doi.org/https://doi.org/10.1080/02619768.2020.1793946>
- Østerlie, O., & Kristensen, G. O. (2023, 05//). Norwegian Physical Education Teacher Education Students' Perceptions of the Subject Physical Education: A Qualitative Study of Students' Reflections before Starting Their Studies [Article]. *Education Sciences*, 13(5), 499. <https://doi.org/10.3390/educsci13050499>
- Peralta, L. R., Bennie, A., Gore, J., & Lonsdale, C. (2021). An Investigation of the Influence of Video Types and External Facilitation on PE Inservice Teachers' Reflections and Their Perceptions of Learning: Findings From the AMPED Cluster Controlled Trial. *Journal of Teacher Education*, 72(3), 368-380. <https://doi.org/https://doi.org/10.1177/0022487120964079>
- Prado, E. L.-d.-A., Gorrotxategi, A. M., García, N. A., & Pérez, M. B. (2019). More about strategies to improve the quality of joint reflection based on the theory-practice relationship during practicum seminars. *Reflective Practice*, 20(6), 790-807. <https://doi.org/10.1080/14623943.2019.1690982>
- Ruffinelli, A., de la Hoz, S., & Álvarez, C. (2020). Practicum tutorials in initial teacher training: conditions, strategies, and effects of reflective practice. *Reflective Practice*, 21(1), 54-67.
- Saiz-Linares, Á., & Susinos-Rada, T. (2020). Revisiting reflection in pre-service teacher training: Let's rethink through a practicum in Spain. *Reflective Practice*, 21(5), 629-645. <https://doi.org/10.1080/14623943.2020.1785414>
- Schön, D. A. (1983). *The reflective practitioner*. Basic Books.
- Schön, D. A. (1995). *The reflective practitioner: How professionals think in action*. Basic Books.
- Sicora, A. (2019). Reflective practice and learning from mistakes in social work student placement. *Social Work Education*, 38(1), 63-74.
- Standal, Ø. F., & Moe, V. F. (2013). Reflective practice in physical education and physical education teacher education: A review of the literature since 1995. *Quest*, 65(2), 220-240. <https://doi.org/https://doi.org/10.1080/00336297.2013.773530>
- Tinning, R. (2016). Transformative pedagogies and physical education: Exploring the possibilities for personal change and social change. In *Routledge handbook of physical education pedagogies* (pp. 299-312). Routledge.

Walters, W., MacLaughlin, V., & Deakin, A. (2023, 2023/01/02). Perspectives and reflections on assessment in physical education: A narrative inquiry of a pre-service, in-service and physical education teacher educator. *Curriculum Studies in Health and Physical Education*, 14(1), 73-91. <https://doi.org/10.1080/25742981.2022.2053334>

Chapter II – Theoretical Articles

Systematic Review

The development of reflective skills in physical education teacher education: a systematic review

El desarrollo de habilidades reflexivas en la formación del profesorado de educación física: una revisión sistemática

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Abstract

Research has shown an increased attention towards Reflective Practice as a successful aspect in the professional development of Physical Education Teacher Education. Notwithstanding, there is a lack of empirical research about how teachers' reflective skills should be developed in this context. The aim of this systematic review was to understand what and how has been studied about physical education teachers' reflective skills, and how such strategies can be further developed and refined in Physical Education Teacher Education. Following Preferred Reporting Items for Systematic Reviews and Meta-analysis (PRISMA) (Page et al., 2021) six databases were included to ensure that all relevant data was considered, and criteria scales were adapted in order to access studies' quality. The results show the importance of incorporating meticulously planned and organized practicum in teachers' training of reflective skills. Despite the importance of collaborative work in reflective skills development, there is a need to perform a deeper examination of those which contribute to improve reflective skills and how teachers develop reflection in collaborative settings, such as through the examination of communities of practice. Besides, writing reflections and video-taped classroom situations can enhance teachers' reflective skills, although supervision is required. This review highlights the important yet challenging role of teachers' reflective skills investigation, in order to achieve a deeper understanding of the contexts and strategies through which this issue is developed.

Key words: collaborative work, professional development, reflective practice, reflection levels, critical reflection.

Resumen

La investigación ha mostrado un incremento de la atención hacia la Práctica Reflexiva, como un aspecto exitoso en el desarrollo profesional de la Formación de Profesores de Educación Física. No obstante, falta investigación empírica sobre cómo se deben desarrollar las habilidades reflexivas de los docentes en este contexto. El objetivo de esta revisión sistemática fue comprender qué y

cómo se han estudiado las habilidades reflexivas de los profesores de educación física, y cómo dichas estrategias pueden desarrollarse y refinarse aún más en la Formación del Profesorado de Educación Física. Siguiendo Preferred Reporting Items for Systematic Reviews and Meta-analysis (PRISMA) (Moher et al., 2009), se incluyeron seis bases de datos para garantizar que se consideraron todos los datos relevantes, y se adaptaron las escalas de criterios para acceder a la calidad de los estudios. Los resultados muestran la importancia de incorporar prácticas minuciosamente planificadas y organizadas en la formación de habilidades reflexivas de los docentes. Pese a la importancia del trabajo colaborativo en el desarrollo de habilidades reflexivas, es necesario examinar en profundidad aquellas prácticas que contribuyen a mejorar las habilidades reflexivas y cómo los docentes desarrollan la reflexión en entornos colaborativos, mediante el examen de comunidades de práctica. Además, las reflexiones escritas y la grabación en vídeo de las situaciones de clase pueden mejorar las habilidades reflexivas de los profesores, aunque se requiere supervisión. Esta revisión destaca el papel importante, pero desafiante, de la investigación sobre las habilidades reflexivas de los docentes, para lograr una comprensión más profunda de los contextos y estrategias a través de los cuales se desarrollan las mismas.

Palabras clave: trabajo colaborativo, desarrollo profesional, práctica reflexiva, niveles de reflexión, reflexión crítica.

Introduction

Research has shown that promoting reflection can be a successful aspect of professional development efforts (Beauchamp, 2015; Brantley-Dias et al., 2021; Lasheras et al., 2019). Many researchers agree that reflection is the key aspect of building a 'self' and developing an ongoing need for professional development (Isik-Ercan & Perkins, 2017; Korthagen & Vasalos, 2005; Marzano, 2012). Such ideas have particular implications in teacher education (Osmanović-Zajić & Maksimović, 2020), as teachers (student-teachers, pre-service teachers, novice teachers and expert teachers) should be 'thoughtful and alert' in order to grow as practitioners. In change processes, reflection seems to serve two purposes (Dewey, 1965). First, reflection can create the internal dissonance necessary to close gaps between teachers' actions and their beliefs about learning (Wedman et al., 1999). Second, reflection forces teachers to critically examine their work and make improvements as needed. Reflection directs teachers' natural inclination to act on tacit knowledge into practice based on well-reasoned knowledge (Fernández et al., 2022; Richardson, 1990). Through the use of reflection questions, an understanding is developed of how the implementation of the goals went that day, how the teacher feels about the goals they're implementing, and what to focus on next. In this sense, reflection has been considered a skill of utmost importance for teachers (Bengtsson, 1995; Playsted, 2019).

However, reflection cannot be developed within abstraction and detached from the real practice context, as only learning by doing involves appropriate paths to develop such skills (Gibbs, 1998; Mesquita et al., 2012). Reflective practice (RP) was coined by Schön (1983) to describe the use of reflection in professional or educational contexts and has consequently been identified as central to educational settings (O'Brien, 2016). Indeed, the role of RP in teacher education has been increasingly highlighted over the last decade (Hains-Wesson & Young, 2017). Therefore, implementing RP in teacher education has the

potential to help future¹ teachers become thoughtful and open-minded practitioners, who take responsibility for their own learning process and genuinely care about their students (Attard & Armour, 2005; Pike, 2015). Over the years, various definitions of RP have been presented in the literature. Namely, it has been defined as 'an active, dynamic, action-based, and ethical set of skills used in real time and in dealing with real, complex, and difficult situations' (Bright, 1996, p. 162) as well as a 'thoughtful consideration of one's experience in applying knowledge to practice' (Schön, 1983, p. 18). Moon (2004) added that RP is a critical stance to solve professional problems in the light of theory to find out the inconsistencies and similarities between theorize practice and actual practice. Indeed, RP is crucial for teachers to actively participate in an ongoing growth process that results from continuous critical reflection on their teaching practice (Larrivee, 2010).

Therefore, a broad consensus exists that RP has become important for academic and professional development (Khazaeenezhad et al., 2018; Watts, 2019). By reflecting on what happens in the classroom, teachers can promote effective change. They can perceive their experiences in a different perspective and change their actions or reactions to future experiences based on their reflections (Ussher & Chalmers, 2011). By reflecting on their practice, teachers can figure out teaching problems, evaluate their teaching behaviours, and improve their teaching skills (Ling, 2018). However, in order to develop teachers as reflective practitioners, it is necessary to develop their reflective skills, such as the identification of an area to reflect, selection of key aspects to reflect, making sense, integration with existing knowledge and planning to make changes in the future. Reflective skills are therefore necessary to engage teachers in reflective practice, since they involve the ability to remember, analyse, synthesize, plan, implement, and understand their practices and themselves (Henderson & Johnson, 2002). Through reflective skills, teachers can focus on the key aspects

¹For the purposes of this review, student-teachers were considered as PETE students in their curricular year, pre-service teachers as teachers in field experience, novice-teachers as teachers in their first five years of teaching and expert teachers as teachers with more than five years of experience (González-Calvo & Fernández-Balboa, 2018; Jin, Li, Meirink, van der Want, & Admiraal, 2019).

of their practice and, based on the knowledge they have, choose the most appropriate planning to change future actions and consequently improve their practice (Vivekananda-Schmidt et al., 2011).

Notwithstanding, teachers' reflective skills can only be developed from practice in real contexts, rather than being taught through direct teaching strategies and approaches that focus more on technical aspects (Nagle, 2008). This implies the development of teachers' reflective skills are triggered from the ambiguity and complexity of real practice and real problems that arise from the daily 'chaotic practice'. Therefore, reflective skills are configured as a tool of reflective work that needs to be implemented in teachers' real-life practice. Nevertheless, teacher education programs have been enhancing 'specific skills' sometimes designated as tips and hints (Moody, 2009). Furthermore, even in those education programs that aim to promote the development of teacher' reflective skills, solutions have been failing during their training, mainly given the use of direct teaching strategies and approaches more focused on the technical level of reflection (Nagle, 2008). To date, there is limited evidence on how to map theory to the complexity of practice and how to improve the development of teachers' reflective skills to enable deeper RP (Harford & MacRuairc, 2008; Winkel et al., 2017)

Teachers' use of reflective skills becomes particularly relevant within Physical Education (PE) because this is an ambiguous, complex, unpredictable and dynamic context (Ward et al., 2014). Specifically, PE teachers are required to manage and solve complex problems that arise in their daily practice due to the nature of the subject (Kirk et al., 2006). Consequently, an essential task of Physical Education Teacher Education (PETE) should be the development of reflective skills , so that teachers learn to think critically and transform the information conveyed into personally meaningful understanding (Mesquita et al., 2015). Therefore, this could encourage teachers to reflect and transform knowledge into personally grounded understanding (N. Entwistle & A. Entwistle, 1991). However, little empirical research on this topic was found by Tsangaridou and Siedentop (1995) within the PE and PETE literature. A few years later, Standal and Moe (2013) reviewed the empirical knowledge base for reflection

and reflective practice in PE and PETE from 1995 to 2011 in order to assess whether there was a robust evidence base for RP in these contexts. These authors found that students made little progress in critical reflection and, in the context of PE, teachers expressed a need for reflective communities (Standal & Moe, 2013). However, the topic of reflective skills development in educational contexts, particularly in PE, is still absent. It is therefore critical to examine what is known about PE teachers' reflective skills, how they have been studied, and how such strategies can be further developed and refined in PETE to guide future research and practice. The present study was undertaken to map the existing literature and ultimately construct a theoretical framework that can serve other studies on reflective practice and reflective skills in PETE.

Methods

Eligibility criteria

The present systematic review was conducted in accordance with the Preferred Reporting Items for Systematic Reviews and Meta-analysis (PRISMA) (Page et al., 2021) (Table 1). In particular, empirical articles were considered eligible for inclusion if published in peer-reviewed international journals with an impact factor indexed in Journal Citation Reports (JCR) or Scimago Journal & Country Rank (SJR). In addition, only articles published between January 2000 and March 2021 were included. Following Alexander's (2020) recommendations, significant dates should be identified for each topic, so a time interval for the research was limited to this date range, as interest in this topic has increased significantly since 2000. Participants, interventions, comparators, outcomes, and study design (PICOS) were defined as followed: (i) physical education teachers with no restrictions regarding sex, age, experience or context of intervention (university, primary, elementary, etc.); (ii) interventions focused on the development of teachers' reflection skills; (iii) comparators not required; (iv) demonstrated how reflection was analysed, developed, and/or identified; (v) no limitations imposed on study design. Using these criteria, this review considers studies that focus on qualitative and quantitative data, including but not limited to

designs such as phenomenology, grounded theory, ethnography, action research, and feminist research (Institute, 2014). In addition, papers using mixed methods were also considered.

Studies were excluded if: (i) not published in peer-reviewed international journals with impact factor; (ii) published before 2000; (iii) not focused on the development of physical education teachers' reflective skills; (v) not empirical studies, such as opinion articles, review articles, editorials, conference proceedings, chapters in books, and narrative articles - 'grey literature' (Alexander, 2020); (vi) not published in English, Portuguese or Spanish.

Table 1 - *PRISMA Checklist*

Section and topic	Item #	Checklist item	Location where item is reported
Title			
Title	1	Identify the report as a systematic review.	✓
Abstract			
Abstract	2	See the prisma 2020 for abstracts checklist.	✓
Introduction			
Rationale	3	Describe the rationale for the review in the context of existing knowledge.	✓
Objectives	4	Provide an explicit statement of the objective(s) or question(s) the review addresses.	✓
Methods			
Eligibility criteria	5	Specify the inclusion and exclusion criteria for the review and how studies were grouped for the syntheses.	✓
Information sources	6	Specify all databases, registers, websites, organisations, reference lists and other sources searched or consulted to identify studies. Specify the date when each source was last searched or consulted.	✓
Search strategy	7	Present the full search strategies for all databases, registers and websites, including any filters and limits used.	✓
Selection process	8	Specify the methods used to decide whether a study met the inclusion criteria of the review, including how many reviewers screened each record and each report retrieved, whether they worked independently, and if applicable, details of automation tools used in the process.	✓
Data collection process	9	Specify the methods used to collect data from reports, including how many reviewers collected data from each report, whether they worked independently, any processes for obtaining or confirming data from study investigators, and if applicable, details of automation tools used in the process.	✓
Data items	10a	List and define all outcomes for which data were sought. Specify whether all results that were compatible with each outcome domain in each study were sought (e.g. For all measures, time points, analyses), and if not, the methods used to decide which results to collect.	✓
	10b	List and define all other variables for which data were sought (e.g. Participant and intervention characteristics, funding sources). Describe any assumptions made about any missing or unclear information.	✓
Study risk of bias assessment	11	Specify the methods used to assess risk of bias in the included studies, including details of the tool(s) used, how many reviewers assessed each study and whether they worked independently, and if applicable, details of automation tools used in the process.	✓
Effect measures	12	Specify for each outcome the effect measure(s) (e.g. Risk ratio, mean difference) used in the synthesis or presentation of results.	Na
Synthesis methods	13a	Describe the processes used to decide which studies were eligible for each synthesis (e.g. Tabulating the study intervention characteristics and comparing against the planned groups for each synthesis (item #5)).	✓
	13b	Describe any methods required to prepare the data for presentation or synthesis, such as handling of missing summary statistics, or data conversions.	-
	13c	Describe any methods used to tabulate or visually display results of individual studies and syntheses.	✓
	13d	Describe any methods used to synthesize results and provide a rationale for the choice(s). If meta-analysis was performed, describe the model(s), method(s) to identify the presence and extent of statistical heterogeneity, and software package(s) used.	✓
	13e	Describe any methods used to explore possible causes of heterogeneity among study results (e.g. Subgroup analysis, meta-regression).	Na
	13f	Describe any sensitivity analyses conducted to assess robustness of the synthesized results.	✓

Table 1. (continued)

Reporting bias assessment	14	Describe any methods used to assess risk of bias due to missing results in a synthesis (arising from reporting biases).	√
Certainty assessment	15	Describe any methods used to assess certainty (or confidence) in the body of evidence for an outcome.	Na
Results			
Study selection	16a	Describe the results of the search and selection process, from the number of records identified in the search to the number of studies included in the review, ideally using a flow diagram.	√
	16b	Cite studies that might appear to meet the inclusion criteria, but which were excluded, and explain why they were excluded.	-
Study characteristics	17	Cite each included study and present its characteristics.	√
Risk of bias in studies	18	Present assessments of risk of bias for each included study.	Na
Results of individual studies	19	For all outcomes, present, for each study: (a) summary statistics for each group (where appropriate) and (b) an effect estimate and its precision (e.g. Confidence/credible interval), ideally using structured tables or plots.	Na
	20a	For each synthesis, briefly summarise the characteristics and risk of bias among contributing studies.	Na
Results of syntheses	20b	Present results of all statistical syntheses conducted. If meta-analysis was done, present for each the summary estimate and its precision (e.g. Confidence/credible interval) and measures of statistical heterogeneity. If comparing groups, describe the direction of the effect.	Na
	20c	Present results of all investigations of possible causes of heterogeneity among study results.	-
	20d	Present results of all sensitivity analyses conducted to assess the robustness of the synthesized results.	√
Reporting biases	21	Present assessments of risk of bias due to missing results (arising from reporting biases) for each synthesis assessed.	Na
Certainty of evidence	22	Present assessments of certainty (or confidence) in the body of evidence for each outcome assessed.	√
Discussion			
	23a	Provide a general interpretation of the results in the context of other evidence.	√
Discussion	23b	Discuss any limitations of the evidence included in the review.	√
	23c	Discuss any limitations of the review processes used.	√
	23d	Discuss implications of the results for practice, policy, and future research.	√
Other information			
Registration and protocol	24a	Provide registration information for the review, including register name and registration number, or state that the review was not registered.	√
	24b	Indicate where the review protocol can be accessed, or state that a protocol was not prepared.	√
	24c	Describe and explain any amendments to information provided at registration or in the protocol.	√
Support	25	Describe sources of financial or non-financial support for the review, and the role of the funders or sponsors in the review.	√
Competing interests	26	Declare any competing interests of review authors.	√
Availability of data, code and other materials	27	Report which of the following are publicly available and where they can be found: template data collection forms; data extracted from included studies; data used for all analyses; analytic code; any other materials used in the review.	√

Legend: √ - Yes; NA – non applicable; - No

Information sources

A comprehensive computerized search of the following seven electronic databases was performed: *Scopus*, *Web of Science*, *Academic Search Ultimate*, *APA PsycInfo*, *ERIC*, *Education Source* and *Teacher Reference Center*. Boolean operators were applied into searching the article title, keywords and abstract: (“reflection skills”) or (“reflective skills”) or (“reflective practice”), AND (“teacher”) AND (“physical education”). In addition, the authors performed a manual search of the studies’ references included in the automatized search to find other articles not identified in the computerized search.

To increase the trustworthiness of the review’s findings by removing

personal bias and to minimize the potential for error, this review was conducted by two researchers (Aromataris & Pearson, 2014; Porritt et al., 2014; Riesenbergs & Justice, 2014) and any disagreements about inclusion were resolved through discussion until consensus was reached. Additionally, a library expert was consulted for support and guidance in developing keywords, identifying appropriate databases, and designing the search strategy (Butler et al., 2016). Reasons for exclusion were noted for all full papers accessed (contact first author) (Butler et al., 2016).

Data items

In order to analyse all the information from the studies selected to this review, conventional content analysis was used (Hsieh & Shannon, 2005; O'Brien et al., 2014). To provide an analytical approach and to put into evidence the information that could give an answer to our aim (Institute, 2014), a framework was created a priori (Harris et al., 2014), which included: (i) author, (ii) study focus, (iii) research design, (iv) participants and context, (v) data sources, (vi) data analysis, (vii) main results, and (viii) how reflection was developed (strategies, frameworks, and levels of reflection). The first author reviewed all included papers and the first and second authors reviewed the data synthesis. Disagreements were discussed and resolved by the three authors until consensus was reached (Alexander, 2020).

Assessment of studies quality

Given the methodological focus, it was critical to assess the quality of the studies reviewed (Gascoine et al., 2017). Specifically, the analysis of the quality of the studies which provided "data relevant to the authors' critical questions in a manner that indicates the reliability and validity of those data" (Alexander, 2020, p. 15). The framework for this assessment was created by two reviewers (first and second author) to ensure the quality of data extraction. Differences between the two authors were discussed and agreed upon. The third author was consulted when differences could not be resolved.

The criteria used to assess the quality of the studies were adapted from the Standards for Reporting Qualitative Research scale (O'Brien et al., 2014) and the Mixed Methods Appraisal Tool (MMAT) (Hong et al., 2018). This scale has a total of 15 items (the items differ according to the methods of the studies, i.e., quantitative, qualitative, or mixed) and is flexible enough to accommodate different paradigms, approaches, and methods presented in this review. Each study was given a score from 0 to 15 and coded as being of low (score of 0-5), medium (score of 6-10) or high quality (score of 11-15). Articles were not excluded based on low scores. Instead, scores were used to weight confidence in each outcome during synthesis (Herbert et al., 2017).

Methodologic quality of studies

Combining the Standards for Reporting Qualitative Research scale (O'Brien et al., 2014) and the Mixed Methods Appraisal Tool (MMAT) (Hong et al., 2018) resulted in a mean of these checklists (Range 87,3%). All included studies were rated as having moderate methodological quality (Table 2).

Table 2 - Methodologic quality of studies

		Casey (2012)		Crawford,O'Reilly and Luttrell (2012)		Dervent (2015)		Fletcher, Chróinín and O'Sullivan(2018)		Font (2009)		Garrett and Wrench (2008)		Gillespie (2011)		González-Calvoa and Fernandez-Balboa (2018)		Jung (2012)		Keay (2006)		Lamb (2015)	
		R1	R2	R1	R2	R1	R2	R1	R2	R1	R2	R1	R2	R1	R2	R1	R2	R1	R2	R1	R2	R1	R2
	Title	1	1	1	0	1	0	1	0	1	0	1	0	1	0	1	1	1	0	1	0	1	0
	Abstract	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
	Introduction																						
	Problem formulation	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
	Purpose or research question	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
	Methods																						
Qualitative studies	Q1	1	1	0	1	1	1	1	1	0	1	1	1	1	1	1	1	1	1	1	1	1	1
	Q2	1	1	1	1	1	1	1	1	0	1	1	1	1	1	1	1	1	1	1	1	1	1
	Q3	1	1	1	1	1	1	1	1	0	0	1	1	1	0	1	1	1	1	1	1	1	1
	Q4	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
	Q5	1	1	1	1	1	1	1	1	0	0	1	1	0	0	1	1	1	1	1	1	1	1
Quantitative studies	Q6																			1	1		
	Q7																			1	1		
	Q8																			1	1		
	Q9																			1	1		
	Q10																			0	0		
Mixed-Methods studies	Q11																			1	1		
	Q12																			1	1		
	Q13																			0	1		
	Q14																			0	1		
	Q15																			0	1		
	Results																						
	Q16	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
	Q17	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
	Discussion																						
	Q18	1	1	1	1	1	1	1	1	0	1	1	1	1	1	1	1	1	1	1	1	1	1
	Q19	0	1	0	0	1	1	1	1	0	0	0	0	0	0	1	0	1	0	1	0	1	0
	Other																						
	Q20	0	1	0	1	0	1	1	1	0	1	0	1	0	1	1	1	0	1	0	1	0	1
	Q21	0	0	0	0	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	1	0

Table 2. (continued)

		Lamb (2015)		Lamb and Aldous (2016)		Lamb, Lane and Aldous (2012)		Macphail and Sohun (2019)		Melnychuk (2001)		Mooney and Hickey (2017)		Østergaard (2019)		Peralta, Bennie, Gore and Lonsdale, 2020		Senne and Rikard (2002)		Senne and Rikard (2004)		Tsangaridou and Polemitou (2015)		Whittle, Telford and Benson (2018)		Zhu (2011)	
		R1	R2	R1	R2	R1	R2	R1	R2	R1	R2	R1	R2	R1	R2	R1	R2	R1	R2	R1	R2	R1	R2	R1	R2	R1	R2
	Title	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0
	Abstract	1	1	1	1	1	1	1	1	1	1	1	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1
	Introduction																										
	Problem formulation	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
	Purpose or research question	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
	Methods																										
Qualitative studies	Q1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
	Q2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
	Q3	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
	Q4	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
	Q5	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Quantitative studies	Q6																	1	1	1	1						
	Q7																	1	1	1	0						
	Q8																	1	1	1	1						
	Q9																	1	0	0	0						
	Q10																	1	1	1	1						
Mixed-Methods	Q11																	1	1	1	1						
	Q12																	1	1	1	1						
	Q13																	1	1	1	1						
	Q14																	1	1	1	1						
	Q15																	1	1	1	1						
	Results																										
	Q16	1	1	1	1	1	1	1	1	1	1	1	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1
	Q17	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
	Discussion																										
	Q18	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
	Q19	1	0	1	1	0	0	0	0	1	1	0	0	1	1	1	1	1	1	1	1	1	1	1	1	1	0
	Other																										
	Q20	0	1	0	1	0	1	1	1	0	1	1	1	1	1	0	1	0	1	0	1	1	1	0	1	0	1
	Q21	1	0	0	0	1	1	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0

Results

Studies selection

From the identified articles, our searches initially yielded a total of 190 publications without inclusion criteria. This initial searching of data bases was then exported to a reference manager software (EndNote™ X9, Clarivate Analytics, Philadelphia, PA, USA). Duplicates (n=36), articles not published in peer-reviewed international journals with impact factor (n= 24) and articles published before year 2000 (n=18) were then removed. The remaining articles were then screened (title, abstract, keywords and full article if necessary) and removed if: did not integrate the keywords (n=70) not focused on physical education teachers' reflective skills (n=14), not in English, Portuguese or Spanish (n=13) and without access (n=3). The current review identified 23 studies on the topic of reflective skills (figure 1). These articles were then deeply analysed data items can be found in table 2.

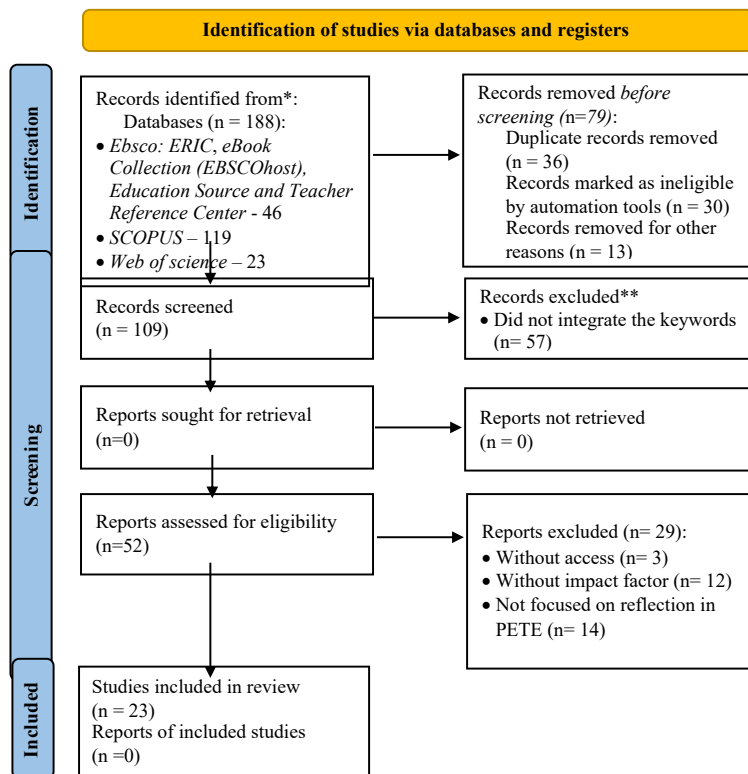


Figure 1. PRISMA Flow diagram

Table 3. Data items used to analyze studies

Authors	Study focus	Rsearch design	Participants/ Context	Data sources	Data analysis	Results	How the reflection was developed (individual/collaborative work, strategies and framework)
Casey (2012)	To explore a teacher's self-study of pedagogical and curricular change through reflective practice and 'insider' action research.	Qualitative. Action-research and self-study. 1 year and 8 months.	1 expert PE teacher. Grammar school in England, UK.	Critical friends. Reflective diaries. Unit diaries. Post-teaching reflective analysis. Student group interviews.	Inductive analysis.	Insider action-research and reflective practice should be seen as a vital ingredient in sustainable educational innovation, needs to be hand-in-hand with collaboration with significant others, and it needs to engage in a critique of the extra-individual conditions as part of the reflective process.	Individual. Aligned with the study purpose, no strategies and frameworks were considered in this article.
Crawford, O'Reilly and Luttrell (2012)	The effects of using the reflective framework for teaching in physical education on the teaching and learning of undergraduate sport studies and physical education students.	Qualitative. Longitudinal. Exploratory. Semester-long module in sport, physical activity and disability	6 student-teachers Sport studies and physical education students. University College Cork, Republic of Ireland.	Interviews. Reflective logs. Observations. Video analysis.	Inductive and content analysis. Case analysis and cross case analysis.	The reflective pedagogical strategies such as logs, video commentaries and school observations that included specific and challenging questions influenced pre-service teachers to develop more analytical responses to their teaching as presented in the framework for	Collaborative. Strategies: reflective logs, questions, video analysis and observations of others. Tsangaridou and O'Sullivan's (1994) Reflective Framework

Table 3. (continued)

						teaching in physical education. Student-teachers' reflections were mostly sensitizing.	for Teaching in Physical Education.
(Dervent, 2015a)Dervent (2015)	To determine the effect of reflective thinking on the professional teaching practices of pre-service PE teachers and to explore their reflective levels.	Qualitative. Action-research. 2 Months (10 weeks)	10 pre-service PE teachers in Marmara University in Istanbul, Turkey.	Reflective journals. Interviews. Video recordings. Micro teaching sessions	Content analysis.	At the beginning of PE PSTs reflection, the participants were at the technical level of the reflective framework; then they started to reflect at both contextual and dialectical levels. The reflective thinking framework allowed PSTs to focus on their application of their knowledge and enabled them to generate a conscious awareness of their professional development. PE PSTs displayed professional development in proper planning, time management, and use of school facilities.	Collaborative. Strategies: reflective journals, a microteaching session, discussions about problems, interviews both at the practice school site and on campus, three school site visits to observe the PE PSTs, problem discussion sessions and collaborating with their peers. The reflective thinking pyramid of Taggart and Wilson (1998).
Fletcher, Chr��n��n and O'Sullivan (2018)	To examine the ways, it accessed and responded to students' engagement with a set of pedagogical principles of teacher education focused on meaningful physical education (trough	Qualitative, Longitudinal, Cross-cultural self-study.	2 teachers. Undergraduate physical education program and primary teacher	Written reflections. Non-participant observations.	Inductive coding and analysis.	The concepts of reflection on- and in-action provided a framework for understanding how being more intentional about accessing student perspectives can be	Collaborative. Strategies: written reflections and critical friends.

Table 3. (continued)

	reflection on- and in-action).	1 year.	education program. 48 students. Brock University, Canada and Mary Immaculate College, Ireland.	Critical incident reflections with a critical friend. 3-way recorded Skype conversation. Meta-critical friend.		enacted in teacher education practice.	
Font (2009)	To construct and reconstruct, teachers' knowledge of values education through PE.	Qualitative, Longitudinal, Exploratory. 2 years.	14 Experts PE Teachers. 1 Academic Teacher. 1 Research teacher. Different schools in Cerdanyola, Spain.	Not defined.	Not defined.	Reflection on teaching practice itself, exchange of experiences between peers, and the shared design and implementation of a project for innovation in the classroom, are the keys that benefit the professional development of the participants.	Collaborative. Strategies: Seminar and group discussions with a facilitator.
Garrett and Wrench (2008)	To examine how exposure to a diverse range of personal experiences and then guided self- reflection of lab school episodes could be harnessed to assist student teachers to reflect more critically and make meaningful connections with their diverse and complex learners.	Qualitative. Longitudinal. Exploratory. 5 weeks.	154 student-teachers. Primary school. University in Australia.	Teacher written reflections. Semi-structured interviews (only 50 student-teachers).	Analytic induction.	The data gathered and analyzed in this study provided a deeper understanding of student teacher learners as well as the factors that support and hinder their engagement with critical perspectives. The ways of describing, informing, confronting and reconstructing were not happening for all student teachers in the study. Limited exposure to practical examples of alternative approaches within university-based	Individual Strategies: lecture and workshop. Lab schools' experiences. Question sheets to guide student-teachers reflection and observation. No framework.

Table 3. (continued)

						experiences also served to compromise student teachers' acceptance of critical methods. Without a full vocabulary of critical pedagogy student teachers found difficulty in describing these aspects of their lessons in detail. Combined strategies lay foundations that will enable student teachers to 'do things differently'.	
Gillespie (2011)	Explore the significance of curriculum value orientations for curriculum implementation and, therefore, for teacher education.	Qualitative. Cross-sectional.	6 teachers. Secondary schools. Aotearoa, New Zealand.	Interviews.	Not defined.	The paper draws the attention to the significance of course content, practicum, critically reflective practice, and programme structures in relation to efforts to embed value orientations into teacher education programmes.	Individual. No strategies and frameworks were considered in this article.
González-Calvo and Fernández-Balboa (2018)	To analyse the factors determining the quality of relationships between a novice physical education teacher and his students' families and understand the implications of these relationships from a longitudinal (self-) reflective teaching diary.	Qualitative. Longitudinal. Self-study. 5 years.	1 novice PE teacher. Public primary and secondary schools. Madrid, Spain.	(Self-)reflective teaching diary.	Content and categorical analyses. Inductive and deductive analysis.	In the first three years of teaching, appeared several specific 'struggle factors' that threatened the teacher's initial pedagogical passion and lead to a great deal of hesitation and discouragement of teacher. In the fourth and fifth years, due to the teacher's ongoing commitment and (self-) reflective practice, there emerged eight 'success factors' that transformed his previous	Individual. Strategy: teaching diary. No framework.

Table 3. (continued)

						discouragement into hope and self-confidence. The concepts of reflection on- and in action provided a framework for understanding how being more intentional about accessing student perspectives can be enacted in teacher education practice.	
Jung (2012)	To investigate the nature of three exceptional PE teachers' reflection in terms of its focus and roles.	Qualitative multiple case study design. Not defined.	3 PE expert teachers. School	Semi-structured interviews. Non-participant observations. Teachers' written reflections. Students' work samples. Relevant archival data. Researcher's field notes.	Constant comparative method. Member Checking.	The teachers' reflection focused on the students, instruction, context, and critical incidents. Reflection impacted the teachers' practice playing key roles such as making sense of unforeseen events, developing knowledge-in-action, making on-the-spot decisions, and reconstructing teachers' belief systems.	Individual. No framework.
Keay (2006)	To determine the effectiveness of Lesson Study, owned and managed by PSTs, in facilitating mutual spaces of pedagogical learning between peers.	Mixed methods. 2 years.	41 novice physical education teachers. Teacher training course. Secondary schools.	Questionnaires. Case-study methodology using semi-structured interviews and "professional life histories".	Comparative analysis. Grounded theory approach.	Reflective practice needs to be undertaken at a more detailed level than merely career options and must include regular reflection on every aspect of the role, and if it is to inform professional learning it must be critical reflection.	Collaborative. No framework.

Table 3. (continued)

			England, UK.	Card check system discussed with others.			
Lamb (2015)	To explore a model of lesson study owned entirely by pre-service teachers, conveying its potential to facilitate mutual spaces of learning between peers beyond formal hierarchical relationships with expert teachers.	Qualitative. Action-research. 38 weeks.	17 pre-service teachers. Master's level in education course. University of East Anglia, Norwich, UK.	Surveys. Individual interviews and questionnaires. Online discussion boards.	Grounded theory. Individual case followed by a cross-case analysis. Inductive analysis.	The Lesson Study facilitated a series of reflective stages, demonstrating awareness, responsiveness, learning and changed action that, in turn, deepened PSTs reflective awareness during subsequent stages, and paralleling reflection in action. Sharing reflective accounts of each lesson as they watched the recording allowed them to learn from each other, whilst considering alternate points of view	Collaborative. Strategy: Lesson study with peer buddies. Fuller's (1969) conceptual framework of teacher development.
Lamb and Aldous (2016)	Explore the role lesson study can play in developing pre-service processes of reflexivity whilst enhancing their reflective practice.	Qualitative. Action-research. 38 weeks.	40 pre-service teachers. Master's level certificate in education course. Eastern England, UK.	Surveys. Individual and in-depth semi-structured focus group Virtual learning environment group discussion.	Grounded theory. Individual case followed by a cross-case analysis. Inductive analysis.	The role of external structures is important in the reflexive process as it enables them to identify the various structures that were shaping their practice. The processes of reflexivity were facilitated by agents sharing experiences and forms of knowledge, drawn from their internal dispositions. The reflective practice is created by student agency rather than the external structures of the it programme.	Collaborative. Strategy: Lesson study with peer buddies. Stones' (2005) framework of reflexivity.

Table 3. (continued)

Lamb, Lane and Aldous (2012)	To determine whether working and learning together autonomously as a pair would extend trainee teachers' ability to reflect.	Qualitative. Longitudinal. Exploratory. 36 weeks.	23 pre-service teachers. Master's level certificate. University of East Anglia, UK.	Surveys. Focus group. Online discussion boards.	Grounded theory. Thematic analysis.	Trainees endorsed the peer review process as a method of engaging in critical reflection. The data illustrated the positive benefits that can be derived from sharing feedback with a peer. The emergent theory presented suggests that the collaborative spaces created by training buddies enhance reflective ability and practice.	Collaborative. Strategy: peer-buddy intervention through video observation No framework.
Macphail and Sohun (2019)	To interrogate a course-embedded service-learning project in a PETE programme to provide a broader, potentially more critical view of the experience, knowledge and learning related to the effort to link service and learning.	Qualitative. Action-research. 6 to 8 weeks.	8 pre-service teachers in focus group 14 in short narratives and 59 in surveys. University of Limerick, Ireland.	Interviews. Focus group. Short narrative responses. Course-specific survey.	Thematic content analysis. Inductive analysis.	Three main challenges arose: linking academic coursework with community service structured through reflective practice; dialogue focusing specifically on PSTS' service-learning partnership and weekly reflections; and discussing the appropriate proposed assessment points.	Collaborative. Strategy: service-learning; lectures and course readings; seminars of reflection and discussion; assessment through diaries and group presentations. No framework.
Melnychuk (2001)	Investigate the lived world of 10 physical education student in secondary schools setting for their final eight-week field experience through a reflective practitioner	Qualitative. Longitudinal. Case-study.	10 student-teachers. Two secondary schools in Alberta, Canada.	Participant and non-participant observation. Field notes. Informal conversation.	Thematic analysis. Triangulation.	The participating student teachers and cooperating teachers of both schools expressed predominantly positive responses to the cohort field experience. Having several student teachers in one department	Collaborative. Reflective practitioner model of teacher education with field experience. Strategy: observation and feedback regarding student-teachers' lessons; private and

Table 3. (continued)

	model of teacher education.	8 weeks.		Journal-writing. Individual and group interview.		was advantageous in many ways, fostering reflective practice, joint thought, and collaborative action. Engagement by all participants in technical and practical levels of reflective thought was evident, whereas engaging in critical reflectivity was less frequent and less obvious.	group conferences; and journal writing. Van Manen (1977) framework.
Mooney and Hickey (2017)	To explore experiences of 'video-stimulated reflection' as a methodological tool for promoting reflective practice with teachers.	Qualitative. Longitudinal. Multiple case-study. 6 months.	2 teachers. Schools in Victoria and Melbourne, Australia.	Video-stimulated reflection interviews.	Data were analyzed by Foucauldian lens.	Specific examples of the ways in which the boys responded to aspects of their practice acted to create moments of professional dissonance, which could be read as stimulating examples of productive reflection.	Individual. Strategy: video-stimulated reflection interviews. Foucault (1988) framework and a feminist poststructuralist perspective.
Østergaard (2019)	To explore how second-order reflection as a tradition-challenging and developing form of reflection can be stimulated by an inquiry-based learning approach in PETE.	Qualitative. Longitudinal. Case study. 6 weeks.	32 pre-service teachers. Danish university college, Denmark.	Video recorded of group discussions and pre-service teachers' performance. Filed notes and written material.	Analytic induction.	During the inquiry-based learning approach the pre-service teachers used both reflection at first and second-order level. Reflections in the form of technical and practical considerations were common. IBL enhanced the second-order reflective skills of	Collaborative. Strategy: Inquiry-based learning approach. Wackerhausen's (2009) anatomy of reflection framework.

Table 3. (continued)

						some of the preservice teachers.	
(Peralta et al., 2020)	To explore the influence of video types and facilitation on PE in-service teachers' reflections and their perceptions of their own and their students' learning.	Qualitative. Exploratory. Cross-sectional.	49 PE teachers (five were considered early career teachers (1–5 years teaching experience), Western Sydney, Australia.	Semi-structured interviews. Evaluations of PE teachers' written reflective statements	Content analysis.	Teachers believed video-based reflection on their own teaching, rather than viewing others' practice, was the most useful, even though both forms of analysis produced a similar depth of reflection. The importance of researchers, teachers, and facilitators delivering and participating in TPD collaboratively and focusing on strategies that may increase the depth of teacher reflection on their own practices, which is considered a first step toward changing classroom practice and improving student outcomes.	Collaborative. Strategy: Workshops, videos and reflection tasks, lesson observation through video, individual meetings with a facilitator. Larrivee's (2008) four levels of reflection using typological analysis (facilitator checklist) to determine the depth of reflection.
Senne and Rikard (2002)	Comparison between two implementations of the PETE teaching portfolio model.	Mixed methods (quantitative quasi-experimental). 2 semesters.	67 pre-service teachers. George Mason University and East Carolina University, EUA.	Portfolio. Defining issues test. Weekly reflection logs. Questionnaire.	T-test. Inductive content analysis.	Most of the student-teachers valued the portfolio process as an indicator of professional growth. Both PETE portfolio models employed conceptual frameworks denoting an emphasis on reflective practice as an underlying premise of the teaching portfolio process. Differences in reflective practice and similarities in	Individual. Strategy: portfolio. Sprinthal & Thies-Sprinthal (1983) Teaching/Learning framework.

Table 3. (continued)

						dual versus single-site placements were noted.	
Senne and Rikard (2004)	To examine and determine the impact of a three-semester developmental portfolio intervention utilizing the Teaching/Learning Framework.	Mixed-methods. (quantitative quasi-experimental) 3 semesters.	18 pre-service teachers. Pseudonymous used for both universities.	Defining issues test. Written portfolio questionnaires. Focus group.	T-test. Inductive content analysis.	Teacher candidates presented more in-depth, critical and more thoughtful reflections from one semester to the next. To conduct portfolio development over the course of three consecutive semesters provides a structure way to develop this skill. It was recommended PETE programs using teaching portfolios initiate the process at least two semesters prior to internship.	Individual. Portfolio. Sprinthal & Thies-Sprinthal (1983) Teaching/Learning framework.
Tsangaridou and Polemitou (2015)	To provide descriptions of the nature of pre-service primary teachers' reflection during their student teaching experience.	Qualitative. Longitudinal. Exploratory. 1 year.	5 pre-service teachers. University of Cyprus, Cyprus.	Written reflective journals. Documents (e.g. lesson and unit plans).	Inductive content analysis. Individual-case and cross-case analysis.	The participants' reflections went beyond a narrow focus on technical and managerial aspects to include content, PCK, and social issues as well. The analysis also indicated that the participants reflected on pedagogical issues almost twice as much as they reflected on PCK, content and social aspects of teaching.	Individual. Reflectively oriented programme (which include several strategies, such as written journals).
Whittle, Telford and Benson (2018)	Explore teacher perceptions of how they influence academic performance of Victorian	Qualitative.	37 teachers.	Focus groups.	Inductive content analysis.	At the individual level teachers perceived content knowledge, expectations, passion and enthusiasm,	Collaborative.

Table 3. (continued)

	certificate of education physical education students.	Longitudinal. Exploratory. 5 months.	31 secondary schools. Secondary schools in Victoria, Australia.	Written field notes.		pedagogical content knowledge and use of reflective practices to inform teaching as key factors influencing student academic performance.	Observation.
Zhu (2011)	To examine student teacher reflective practices during practicum, where instructional activities were structured to promote student teachers' reflection and professional development.	Qualitative. Longitudinal. Exploratory. 1 semester.	12 pre-service. 1 instructor. University in the EUA.	Field observations. Instructional material. Non-participant observations. Semi-structured interviews.	Thematic content analysis.	Student teachers tapped into different types of experiences during practicum for reflection, primarily reflection on action. Reflection in action appeared to be vague and difficult for student teachers due to 'too many things going on' in teaching. Plenty of opportunities for reflection on action were reported, yet few for reflection in action were identified.	Individual. Strategies: internship activities at schools and recall-and-reflection journaling, professional portfolio, and weekly seminar/discussion and homework.

Type of participants and contexts selected for the research studies of teachers' reflective skills

Pre-service teachers were the participants most examined in the studies gathered for this review (n=10) (Dervent, 2015b; Lamb, 2015; Lamb et al., 2016; Lamb et al., 2013; MacPhail & Sohun, 2019; Østergaard, 2019; Senne & Rikard, 2002, 2004; Tsangaridou & Polemitou, 2015; Zhu, 2011), followed by in-service teachers (n= 8) (Casey, 2012; Fletcher et al., 2019; Font, 2009; Gillespie, 2011; Jung, 2012; Mooney & Hickey, 2017; Peralta et al., 2020; Whittle et al., 2018), student teachers (n= 3) (Crawford et al., 2012; Garrett & Wrench, 2008; Melnychuk, 2001b), and novice teachers (n= 2) (González-Calvo & Fernández-Balboa, 2018; Keay, 2006). In terms of contexts chosen, universities predominated (n= 13) (Crawford et al., 2012; Dervent, 2015b; Fletcher et al., 2019; Garrett & Wrench, 2008; Lamb, 2015; Lamb et al., 2016; Lamb et al., 2013; MacPhail & Sohun, 2019; Østergaard, 2019; Senne & Rikard, 2002, 2004; Tsangaridou & Polemitou, 2015; Zhu, 2011) followed by schools (n=10) (Casey, 2012; Font, 2009; Garrett & Wrench, 2008; Gillespie, 2011; González-Calvo & Fernández-Balboa, 2018; Jung, 2012; Keay, 2006; Melnychuk, 2001b; Mooney & Hickey, 2017; Whittle et al., 2018) PETE programs (degree and post-graduate) were the most studied (n=16) (Casey, 2012; Crawford et al., 2012; Dervent, 2015b; Font, 2009; Jung, 2012; Lamb, 2015; Lamb et al., 2016; Lamb et al., 2013; MacPhail & Sohun, 2019; Mooney & Hickey, 2017; Østergaard, 2019; Peralta et al., 2020; Senne & Rikard, 2002, 2004; Tsangaridou & Polemitou, 2015; Zhu, 2011), followed by secondary (n=4) (Gillespie, 2011; Keay, 2006; Melnychuk, 2001b; Whittle et al., 2018), primary (n=2) (Fletcher et al., 2019; Garrett & Wrench, 2008) and both primary and secondary (n=1) (González-Calvo & Fernández-Balboa, 2018).

Methodological designs used for the development of teachers' reflective skills

In the studies considered for this review, two methodological designs were observed, namely qualitative and mixed methods. The most common methodology involved qualitative techniques with intervention (n=20) (Casey, 2012; Crawford et al., 2012; Dervent, 2015b; Fletcher et al., 2019; Font, 2009;

Garrett & Wrench, 2008; Gillespie, 2011; González-Calvo & Fernández-Balboa, 2018; Jung, 2012; Lamb, 2015; Lamb et al., 2016; Lamb et al., 2013; MacPhail & Sohun, 2019; Melnychuk, 2001b; Mooney & Hickey, 2017; Østergaard, 2019; Peralta et al., 2020; Tsangaridou & Polemitou, 2015; Whittle et al., 2018; Zhu, 2011).

Almost all of them were longitudinal studies (n=18) (Casey, 2012; Crawford et al., 2012; Dervent, 2015b; Fletcher et al., 2019; Font, 2009; Garrett & Wrench, 2008; González-Calvo & Fernández-Balboa, 2018; Jung, 2012; Lamb, 2015; Lamb et al., 2016; Lamb et al., 2013; MacPhail & Sohun, 2019; Melnychuk, 2001b; Mooney & Hickey, 2017; Østergaard, 2019; Tsangaridou & Polemitou, 2015; Whittle et al., 2018; Zhu, 2011) while two studies were cross-sectional (Gillespie, 2011; Peralta et al., 2020).

Notably, within these 18 longitudinal studies, seven were purely exploratory (Crawford et al., 2012; Font, 2009; Garrett & Wrench, 2008; Lamb et al., 2013; Tsangaridou & Polemitou, 2015; Whittle et al., 2018; Zhu, 2011), four integrated action-research (Dervent, 2015b; Lamb, 2015; Lamb et al., 2016; MacPhail & Sohun, 2019), and one combined action-research with self-study (Casey, 2012). The remaining longitudinal studies were self-studies (n=2) (Fletcher et al., 2019; González-Calvo & Fernández-Balboa, 2018) and four were based on case-study designs, particularly two were case-studies (Melnychuk, 2001b; Østergaard, 2019), and two were a multiple case-study (Jung, 2012; Mooney & Hickey, 2017).

Of the three studies that used mixed methodology (Keay, 2006; Senne & Rikard, 2002, 2004), two used a longitudinal design, with the quantitative methodology being a quasi-experimental design (Senne & Rikard, 2002, 2004). Although one of these studies included a control group, the authors did not acknowledge an experimental design given the number of participants (Senne & Rikard, 2004). The other was cross-sectional with an exploratory design (Keay, 2006).

The studies included in this systematic review had different time intervals, namely from one month to five years. Only one study did not mention the duration of the intervention (Jung, 2012). In terms of qualitative methods, 12 studies

showed a duration between one and eight months (Crawford et al., 2012; Dervent, 2015b; Garrett & Wrench, 2008; Lamb, 2015; Lamb et al., 2016; Lamb et al., 2013; MacPhail & Sohun, 2019; Melnychuk, 2001b; Mooney & Hickey, 2017; Østergaard, 2019; Whittle et al., 2018; Zhu, 2011), three studies between one year and 18 months (Casey, 2012; Fletcher et al., 2019; Tsangaridou & Polemitou, 2015), one of the studies presented a duration of 2 years (Font, 2009) and another five years (González-Calvo & Fernández-Balboa, 2018). However, the duration of the mixed-methods studies did not show any trend as the protocol interventions had different time intervals, namely two years (n=1) (Font, 2009), 18 months (three semesters; n=1) (Senne & Rikard, 2004) and six months (2 semesters; n=1) (Senne & Rikard, 2002).

Interviews were the most common data collection tool (n=20) (Casey, 2012; Crawford et al., 2012; Dervent, 2015b; Garrett & Wrench, 2008; Gillespie, 2011; Jung, 2012; Keay, 2006; Lamb, 2015; Lamb et al., 2016; Lamb et al., 2013; MacPhail & Sohun, 2019; Melnychuk, 2001b; Mooney & Hickey, 2017; Østergaard, 2019; Peralta et al., 2020; Senne & Rikard, 2004; Tsangaridou & Polemitou, 2015; Whittle et al., 2018; Zhu, 2011). These were individual interviews in eleven studies (Crawford et al., 2012; Dervent, 2015b; Garrett & Wrench, 2008; Gillespie, 2011; Jung, 2012; Keay, 2006; Lamb, 2015; Mooney & Hickey, 2017; Peralta et al., 2020; Tsangaridou & Polemitou, 2015; Zhu, 2011) and group interviews in eight (Casey, 2012; Lamb et al., 2016; Lamb et al., 2013; MacPhail & Sohun, 2019; Melnychuk, 2001b; Østergaard, 2019; Senne & Rikard, 2004; Whittle et al., 2018).

Interviews were followed by written reflections (n=15; mostly individual), questionnaires (n=4) (Keay, 2006; Lamb, 2015; Senne & Rikard, 2002, 2004) field observations (n=5) (Crawford et al., 2012; Fletcher et al., 2019; Jung, 2012; Melnychuk, 2001b; Zhu, 2011), surveys (n=4) (Lamb, 2015; Lamb et al., 2016; Lamb et al., 2013; MacPhail & Sohun, 2019) and field notes (n=4) (Jung, 2012; Melnychuk, 2001b; Whittle et al., 2018).

In terms of qualitative data analysis, the majority of studies gathered for this review used inductive analysis (n=12) (Casey, 2012; Crawford et al., 2012; Fletcher et al., 2019; Garrett & Wrench, 2008; Lamb, 2015; Lamb et al., 2016;

MacPhail & Sohun, 2019; Østergaard, 2019; Senne & Rikard, 2002, 2004; Tsangaridou & Polemitou, 2015; Whittle et al., 2018), followed by both inductive and deductive analysis (n=1) (González-Calvo & Fernández-Balboa, 2018). In the same line, ten studies showed the use of content analysis (Crawford et al., 2012; Dervent, 2015b; González-Calvo & Fernández-Balboa, 2018; MacPhail & Sohun, 2019; Peralta et al., 2020; Senne & Rikard, 2002, 2004; Tsangaridou & Polemitou, 2015; Whittle et al., 2018; Zhu, 2011) and four studies showed thematic analysis (Lamb et al., 2013; MacPhail & Sohun, 2019; Melnychuk, 2001b; Zhu, 2011). Four studies used grounded theory for data analysis (Keay, 2006; Lamb, 2015; Lamb et al., 2016; Lamb et al., 2013). In terms of quantitative data analysis, both studies used T-test analysis (Senne & Rikard, 2002, 2004).

Strategies and theoretical frameworks applied for the development of teachers' reflective skills

With respect to how teachers' reflective skills were developed, 13 of the studies included in this systematic review presented collaborative approaches in which the development of reflective skills occurred through working with other teachers and discussing their practices (Crawford et al., 2012; Dervent, 2015b; Fletcher et al., 2019; Font, 2009; Keay, 2006; Lamb, 2015; Lamb et al., 2016; Lamb et al., 2013; MacPhail & Sohun, 2019; Melnychuk, 2001b; Østergaard, 2019; Peralta et al., 2020; Whittle et al., 2018). Within these studies, the most common strategy was observation of other teachers' practice (video or participant; n=8) (Crawford et al., 2012; Fletcher et al., 2019; Lamb et al., 2013; MacPhail & Sohun, 2019; Melnychuk, 2001b; Østergaard, 2019; Peralta et al., 2020; Whittle et al., 2018), followed by lectures, seminars and group discussions (online or not; n=5) (Casey, 2012; Dervent, 2015b; Lamb, 2015; Lamb et al., 2016; MacPhail & Sohun, 2019) and one of the studies used the Inquiry-Based Learning (IBL) approach (Østergaard, 2019). Despite this collaborative development of teachers' reflective skills, four of these studies also used supplementary written reflections (Fletcher et al., 2019; Østergaard, 2019; Peralta et al., 2020; Whittle et al., 2018).

On the other hand, the other ten studies included in this review used an individual

approach to the development of teachers' reflective skills (i.e., unrelated to others) (Casey, 2012; Garrett & Wrench, 2008; Gillespie, 2011; González-Calvo & Fernández-Balboa, 2018; Jung, 2012; Mooney & Hickey, 2017; Senne & Rikard, 2002, 2004; Tsangaridou & Polemitou, 2015; Zhu, 2011). Within these studies, the majority used written reflections (n=6) (Garrett & Wrench, 2008; Jung, 2012; Peralta et al., 2020; Senne & Rikard, 2002, 2004; Tsangaridou & Polemitou, 2015), observation and discussion of teachers' practice (video-based or not), questionnaires to guide teachers' reflection and observation and lectures and workshops (n=1) (Garrett & Wrench, 2008).

In parallel, ten of the studies used theoretical frameworks to develop teachers' reflective skills that focused specifically on the development of reflection (Casey, 2012; Crawford et al., 2012; Dervent, 2015b; Lamb, 2015; Lamb et al., 2016; Melnychuk, 2001b; Mooney & Hickey, 2017; Østergaard, 2019; Senne & Rikard, 2002, 2004)

Levels of reflection

Only eight studies collected for this review approached levels of reflection (Crawford et al., 2012; Dervent, 2015b; Garrett & Wrench, 2008; Østergaard, 2019; Peralta et al., 2020; Senne & Rikard, 2002, 2004; Zhu, 2011). In particular, Crawford, O'Reilly and Luttrell's (2012) study identified three levels of reflection, namely technical, situational and sensitizing, based on Tsangaridou and O'Sullivan's (1994) Reflective Framework for Teaching in Physical Education (RFTPE). Garret and Wrench (2008) showed that student-teachers moved from purely technical and descriptive reflections to a more critical perspective, thereby questioning and reconstructing their practice. Similarly, Dervent (2015a) found that when participants began reflecting on PE PSTs, they were at the technical level of the reflective framework and then began to reflect at both the contextual and dialectical levels. Østergaard (2019) focused on IBL as a promoter of reflection at different levels and showed the evolution of PSTs from technical and practical reflections to second-order reflections (stimulating professional change). Senne and Rikard (2002) attempted to develop PSTs with higher levels of reflection, and Zhu (2011) showed that PSTs primarily used Schöns' (1987)

reflection-on-action, while reflection-in-action seemed to be vague and difficult.

Discussion

The purpose of this systematic review was to analyse what and how PE teachers' reflective skills have been studied, and how this process could be improved in future research and practice. Mostly through the use of qualitative and longitudinal research designs, results have shown the importance of developing teachers' reflective skills through "real-world practice" (such as PSTs' practicum) and the use of specific strategies to foster them (such as, reflective logs, observation of others, written reflections, portfolios, critical friends, lesson study, lectures, etc.). From these results emerged the need for future research to consider the implementation of action-research designs, and a deeper exploration of both collaborative work and levels of reflection.

In particular, the studies included in this systematic review showed the prevalence of longitudinal qualitative designs and within those the use of sophisticated research designs (19 out of 23 studies), such as action-research and case-studies. However, despite the holistic interpretation offered by action-research, results showed that only five out of nineteen studies used this design (Casey, 2012; Dervent, 2015; Lamb, 2015; Lamb, Ko, & Aldous, 2016; MacPhail & Sohun, 2019). These five studies showed that through the cyclical process in four steps (planning, acting, observing, and reflecting/evaluating), teachers could analyse situations and use their expertise from previous experiences to find appropriate responses and concomitantly develop their reflective skills (Schön, 1983) (such as, identification of an area to reflect upon, selection or focus on key aspects, writing down, making sense and integration with existing knowledge and planning to make changes in the future) to the detriment of neglect reflection (Vivekananda-Schmidt et al., 2011). This process can be described as learning by changing and changing by learning and consistently adapting to the specific needs of the context (Huber et al., 2017; Keegan, 2016; Zajic & Maksimovic, 2020).

Therefore, it is important to enhance that three of those studies (Lamb, 2015; Lamb, Ko, & Aldous, 2016; MacPhail & Sohun, 2019) applied action-research designs during PSTs' practicum. Results demonstrated practicum as an

excellent opportunity for PSTs understand the connection between theory and practice and its application in real practice contexts, as already stated by previous research in other contexts (Mesquita, 2014; Tülüce, 2016). The link between theory and practice during practicum is dependent on reflection, which proclaims the incorporation of theoretical knowledge to analyse practice (Diez-Fernández & Domínguez-Fernández, 2018; Huu Nghia & Tai, 2019). Thus, practice and reflection enter into a complex and binding relationship, as reflection enables teachers to understand, develop and direct learning itself (Mesquita et al., 2015; Moon, 2007; Rogers, 2001). Once action-research bridges the gap between theory and practice, it seems extremely important to include this design to improve the development of teachers' reflective skills during practicum. Although, in the studies examined for this systematic review the most common participants were teachers in their practicum (n=9), only three (Macphail, 2019; Lamb, 2015; Lamb et al., 2016) have included action-research in their designs.

The lack of inclusion of this design at the initial stage of teachers' professional development could limit the analysis and adaptation of PSTs' actions and compromise the development of their reflective skills. Therefore, there is a need to reinforce and clarify the benefits of this design to increase the success of decision making and appropriate adaptation of PSTs' actions.

In addition to the implementation of action research in the PSTs' practicum, collaboration between all stakeholders (e.g., PST, supervisors, peers, and school) also appeared to be crucial in this process (Messiou, 2019), as it promotes demarcation between them and is replaced by the notion that all educators systematically work together to support each other's learning and achieve common goals. As an example, the three aforementioned action-research studies (Lamb, 2015; Lamb et al., 2016; MacPhail & Sohun, 2019) allow the exploration of collaborative work. In two of those studies, collaboration occurred through peer collaboration (Lamb, 2015; Lamb et al., 2016) and in the other through Service-Learning Partnership (MacPhail & Sohun, 2019). The practicum collaboration in Lamb (2015) and Lamb et al. (2016) research was potentiated by the PSTs' collaboration with a peer, specifically through the creation of a peer-buddy intervention. This collaboration not only allowed a less

formal environment outside of the course assessment structure, but also allowed for effective social interaction between peers. Such interactions enabled them to demonstrate expanded forms of active agency and knowledge and to develop practices beyond the traditional support structures of the training program (Dyson, 2006). On the other hand, the collaborative work of Service-Learning Partnership exposed the challenges of creating a generous space for dialog between faculty and PSTs that focused specifically on PSTs reflections. Specifically, in creating space and time for PSTs to explore how their weekly service-learning partnership experience could most effectively contribute to the completion of related assessments (MacPhail & Sohun, 2019).

Collaborative work, however, was found not only in those three action-research studies during PSTS' practicum, but in twelve of twenty-three studies gathered for this review (e.g., Fletcher, Chróinín, & O'Sullivan, 2019; Garrett & Wrench, 2008; Gillespie, 2011; Whittle, Telford, & Benson, 2018). Through collaborative work, individuals share their diverse perspectives, insights, observations, experiences and critically "theorize, interpret, and critically analyse the research of others" (Goodnough, 2010, p. 920). However, results also show that a deeper consideration of collaborative competences, such as interactive skills, inter-professional competences, dialog, the importance of tutors and link workers, and scaffolding strategies, is still lacking in these studies (Keay, 2006; MacPhail & Sohun, 2019). In particular, developing teacher reflection requires more than physical proximity for collaborative learning to occur. It requires intentional engagement (Leeferink et al., 2015) and must integrate cognitive, interactive, and inter-professional skills as well as the specific contexts in which learning occurs (Ruffinelli et al., 2020).

CoPs are understood as experiences in a real context of professional practice of a selected group of individuals who share experiences and deepen their knowledge and expertise by sharing common goals and interacting continuously (Kirk & Macdonald, 1998; Lave & Wenger, 1991; Wenger et al., 2002). Within these CoPs, teachers are only able to take on problems and tasks with complexity above their level when supported by someone more capable (Wink & Putney, 2002), i.e., a learning facilitator (Wenger et al., 2002). Therefore,

CoPs promote insider collaboration between facilitator, teachers, and other colleagues, which increases the development of teachers' reflective practice (Saccomano, 2013).

Regardless of individual or collaborative work, the studies in this systematic review showed that reflective processes must be triggered by the completion of various classroom tasks, such as teaching lessons, lesson plans, and teaching evaluations, which in turn provide the necessary evidence base for assessment processes. However, beyond these "surface-level trigger" tasks (Lamb et al., 2012, p. 22), some studies from this review also implemented specific strategies to encourage the development of reflection activities. Nevertheless, although written reflections are increasingly used in the literature (e.g., portfolios, journals, written reports, reflection diaries, and logs) (Casey, 2012; Fletcher, Chróinín & O'Sullivan, 2018), only nine studies gathered for this systematic review use this strategy in PETE programs (Crawford et al., 2012; Dervent, 2015a; Garrett & Wrench, 2008; MacPhail & Sohun, 2019; Melnychuk, 2001a; Senne & Rikard, 2002, 2004; Tsangaridou & Polemitou, 2015; X. Zhu, 2011).

Some of the studies included in this systematic review show that written reflection differentiates the reflective component of teacher practice (e.g., pedagogical content knowledge, content and social issues of teaching), which increases the depth, critical, and thoughtful content of reflection (Senne & Rikard, 2004; Tsangaridou & Polemitou, 2015). These results corroborate several authors (e.g., Kember et al., 2008; Standal & Moe, 2013; Tsangaridou & Polemitou, 2015), who also argue that written reflections can promote the development of reflection. More specifically, in the first step of reflection writing, the teacher usually becomes aware of a particular aspect of their teaching method that they want to improve (Saavedra Jeldres & Campos Espinoza, 2019). For example, in Tsangaridou's and Polemitou (2015) study present in this review, journal entries were focused on professional knowledge related to specific skills and/or tactics that PSTs taught their students. Then, the teacher experiments with a new approach, and while the experience is recorded, it is reflected upon and analysed to draw conclusions for the future.

In relation to this topic, research has also highlighted the importance of close supervision during the process of producing teachers' written reflections and the more capable the supervisor or facilitator is, the better the reflection will be (Brown et al., 2013; Thomas, 2005). Nevertheless, there is only one study in which the development of a portfolio was conducted through a purposeful and deliberate intervention with a structured supervision to PSTs in order to develop teachers' reflective skills (Senne & Rikard, 2004). This is even more evident when some authors in this review (e.g., Senne & Rikard, 2002) enhance that the use of written reflections can become solely descriptive rather than beneficial. Without a comprehensive vocabulary of critical pedagogy, PSTs found it difficult to describe these aspects of their teaching in detail. Therefore, it seems crucial to develop an approach that prepares PSTs during their training with a specific vocabulary and supervision that could provide the necessary support for the development of reflective skills (Beauchamp, 2015; Körkkö et al., 2016).

In addition to written reflection, the studies collected for this review also use classroom observation (in or out of group and using video or participant observation) as another strategy to promote reflection (e.g., Crawford, O'Reilly, & Luttrell, 2012; Garrett & Wrench, 2008). In the work of Lamb and colleagues (2013), it appears that teachers' reflection during their teaching practice may not provide teachers with the "space" to engage in meaningful reflection and challenge their own practice in a way that leads to sustainable change. Therefore, two years later, following Schön's (1987) reflection- on- action', Lamb and colleagues (2015) found that post-teaching observations could fill this gap. Specifically, by allowing multiple periods of reflection that promote awareness, understanding, learning, and action choice that would enhance PST reflective knowledge in subsequent periods (Lamb et al., 2015). Indeed, this approach enables teachers to develop and disseminate a robust practice skill that engages them in the learning process. In addition, this "outside of practice" reflection allow PSTs to discuss with colleagues whether they are researching, planning, teaching, observing or evaluating (Elliott & Norris, 2012). As the PSTs in Lamb and Aldous's (2016, p. 107) study pointed out, these "external structures" allowed them to "look at things in a different way." Through the outsider perspective, PSTs

were able to identify and clarify the meaning of the specific elements of their practice they were beginning to transform, which often went unnoticed. It then became clear that this structured system was crucial to the reflective process as it brought to light the multiple structures that were responsible for shaping the PSTs' experience (Lamb & Aldous, 2016).

Because video is widely regarded as an effective support tool by researchers and teacher educators (Brophy, 2004; Darling-Hammond, 2006; Goldman, 2007), some of the studies collected in this review have valorised the role of video-based classroom observation (e.g., Crawford et al., 2012; Lamb et al., 2012; Monney & Hickey, 2017). Video has been able to convey all of the nuances that take place in the classroom or instructional scenario in real time, preserving the complexity, richness, and immediacy that are so difficult to achieve through written records (Brophy, 2004; Goldman, 2007). Video allows one to participate in a classroom experience without actually being present and takes away the pressure to interact (Sherin & Han, 2004), which can only be described as a second-hand experience of teaching (Miller & Zhou, 2007). In addition to fostering a connection between theory and practice, video expands the range of classroom practices available for PSTs to observe, which is otherwise impossible when considering only live observations (Bayram, 2012). The research included in this systematic review shows that PST's reflective capacity about classroom events is greatly enhanced by viewing videotaped classroom situations (Crawford et al., 2012; Dervent, 2015a; Lamb et al., 2013; Mooney & Hickey, 2017; Peralta et al., 2020). Thus, it is clear that being able to observe lessons via videotaped observation increases PST's reflective ability and allows them to conduct more detailed analysis of classroom situations (Crawford, O'Reilly, & Luttrell, 2012; Mooney & Hickey, 2017).

Although the studies selected for this review offer new insights into the development of teachers' reflective skills across participants, contexts, and strategies while making an effort to ensure the methodological quality of these studies, disappointing results were found in terms of reflection levels. Specifically, only five studies (Crawford et al., 2012; Garret & Wrench, 2008; Østergaard, 2019; Senne & Rikard, 2002; Zhu, 2011) examined teachers' reflective

development within different levels. This is even more evident since some of these studies (e.g., Zhu, 2011; Garret & Wrench, 2008) mainly reported superficial reflection in reflective practices and rarely delved deeper into critical reflection or reflection-on-reflection (Manen, 1991). In particular, in Zhu's (2011) study, teachers limited their reflection to the events described, habitual common sense thinking and acting (technical) at most justifying decisions made during the events or using practical experiences to make judgments (practical reflection). Therefore, future studies should explore and encourage the development of deeper levels of reflection, such as critical reflection that involves a systemic examination of specific phenomena. In particular, considering ethical or social issues arising from classroom events (e.g., "Did my teaching benefit a particular group of students?") through personal and other individual perspectives. Furthermore, it is crucial that teachers not only act reflexively, but simultaneously pursue a deeper understanding of reflective experiences and their meaning, as well as the types of knowledge they use, as mentioned by Van Manen (1991), or simply put, reflection-on-reflection. Only with this methodology teachers will be able to question or confront the validity of prevailing practices as well as their own practices and beliefs (Bowe et al., 2020). This analytical awareness will allow teachers to reframe their practice and offer insights on how to approach teaching differently and consequently a more equitable, safe, and effective learning environment (Garret & Wrench, 2008). To support a deeper level of teacher reflection, future research should develop frameworks that structure PSTs' cognitive processes (how they reflect), but also the content of their thinking (what they reflect on), the goals of their thinking (why they reflect), and how their thinking influences their classroom teaching practice (what transformative learning they experience) (K. Liu, 2015).

Conclusion

This review could allow us to establish the conclusions such as: Despite some studies that have implemented action research in their designs, there is a need to reinforce and clarify the benefits of this design to increase the success of decision making and appropriate adaptation of teachers' reflection.

Aside from the fact that collaborative work can help improve reflective skills and help teachers develop reflection in collaborative settings, such as through the study of communities of practice, there is a need to conduct a careful examination of the environment of this work.

Although some studies have aimed to develop teachers' reflective skills, showing, for example, that written reflections and videotaped teaching situations can improve teachers' reflective skills, there is still a lack of evidence on how to reach a deeper level of teachers' reflective skills.

Practical implications

As reflection is clearly a process and takes time to develop, future studies should implement and examine written reflections, since they provide the necessary structure to develop this skill and become a valuable tool for teachers to carefully consider their actions and their impact on learners (Saavedra Jeldres & Campos Espinoza, 2019). Particularly, future studies should explore and encourage the development of deeper levels of reflection, such as critical reflection that involves a systemic examination of specific phenomena.

Moreover, future studies should explore more deeply how teachers develop reflection in collaborative settings, for example, by examining communities of practice (CoPs) (Lave & Wenger, 1991) which have been proposed as a means to maximize teachers' experiential learning (MacPhail et al., 2014; ten Dam & Blom, 2006; Timoštšuk & Ugaste, 2010).

Other information

Protocol, registration and support

The methods and protocol registration were preregistered prior to conducting this review: INPLASY protocol 202130079, doi:10.37766/inplasy2021.3.0079. The review protocol can be accessed at <https://inplasy.com/?s=202130079>.

There were no competing interests between authors of the review. Reports of the data used for all analyses are publicly available and can be found at <https://www.dropbox.com/sh/c7mgmjumrb74nhm/AADXnEAx8anwhDuodx8SJpAa?dl=0>

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References

- Alexander, P. A. (2020). Methodological guidance paper: The art and science of quality systematic reviews. *Review of educational research*, 90(1), 6-23.
- Aromataris, E., & Pearson, A. (2014). The systematic review: an overview. *AJN The American Journal of Nursing*, 114(3), 53-58.
- Attard, K., & Armour, K. M. (2005). Learning to become a learning professional: Reflections on one year of teaching. *European Journal of Teacher Education*, 28(2), 195-207.
- Bayram, L. (2012). Use of online video cases in teacher training. *Procedia-Social and Behavioral Sciences*, 47, 1007-1011.
- Beauchamp, C. (2015). Reflection in teacher education: issues emerging from a review of current literature. *Reflective Practice*, 16(1), 123-141.
- Bengtsson, J. (1995). What is reflection? On reflection in the teaching profession and teacher education. *Teachers and Teaching*, 1(1), 23-32.
- Bowe, B. J., Kjesrud, R., & Hemsley, P. (2020). Improving Inquiry Questions to Foster Critical Thinking and Reflective Practice in a Journalism Capstone. *Journalism & Mass Communication Educator*, 1077695820906359.
- Brantley-Dias, L., Puvirajah, A., & Dias, M. (2021). Supporting teacher candidates' multidimensional reflection: a model and a protocol. *Reflective Practice*, 1-16.
- Bright, B. (1996). Reflecting on 'reflective practice'. *Studies in the Education of Adults*, 28(2), 162-184.
- Brophy, J. E. (2004). *Using video in teacher education*: JAI Press Incorporated.
- Brown, J. M., McNeill, H., & Shaw, N. J. (2013). Triggers for reflection: exploring the act of written reflection and the hidden art of reflective practice in postgraduate medicine. *Reflective Practice*, 14(6), 755-765. doi:10.1080/14623943.2013.815612
- Butler, A., Hall, H., & Copnell, B. (2016). A guide to writing a qualitative systematic review protocol to enhance evidence-based practice in nursing and health care. *Worldviews on Evidence-Based Nursing*, 13(3), 241-249.
- Casey, A. (2012). A self-study using action research: changing site expectations and practice stereotypes. *Educational Action Research*, 20(2), 219-232.
- Crawford, S., O'Reilly, R., & Luttrell, S. (2012). Assessing the effects of integrating the reflective framework for teaching in physical education (RFTPE) on the teaching and learning of undergraduate sport studies and physical education students. *Reflective Practice*, 13(1), 115-129. doi:10.1080/14623943.2011.626025
- Darling-Hammond, L. (2006). Assessing teacher education: The usefulness of multiple measures for assessing program outcomes. *Journal of Teacher*

Education, 57(2), 120-138.

Dervent, F. (2015a). The effect of reflective thinking on the teaching practices of preservice physical education teachers. *Issues in Educational Research*, 25(3), 260.

Dervent, F. (2015b). The effect of reflective thinking on the teaching practices of preservice physical education teachers. *Issues in Educational Research*, 25(3), 260-275. Retrieved from <https://www.scopus.com/inward/record.uri?eid=2-s2.0-84940857318&partnerID=40&md5=629ef4ea86dd776c66ad9ab62952bbe0>

Dewey, J. (1965). The relation of theory to practice in education. *Archambault, R. D. (Ed.), John Dewey on education: Selected writings.*

Chicago: The University of Chicago Press. (Original work published in 1904), 313–338.

Diez-Fernández, Á., & Domínguez-Fernández, R. (2018). El Tutor Universitario como Impulsor del Aprendizaje Reflexivo de los Alumnos Durante las Prácticas Docentes. *Estudios pedagógicos (Valdivia)*, 44(2), 311-328.

Dyson, B. (2006). 3.9 Students' perspectives of physical education. *Handbook of physical education*, 326.

Elliott, J., & Norris, N. (2012). *Curriculum, pedagogy and educational research: The work of Lawrence Stenhouse*: Routledge.

Entwistle, N., & Entwistle, A. (1991). Contrasting forms of understanding for degree examinations: the student experience and its implications. *Higher Education*, 22, 205-227.

Fernández, W. J. W., Zwierewicz, M., & Castillo, J. T. (2022). De la práctica pedagógica instrumental a la práctica reflexiva en educación física: retos y posibilidades manifestados en investigaciones precedentes. *Retos: nuevas tendencias en educación física, deporte y recreación*(43), 290-299.

Fletcher, T., Chróínín, D., & O'Sullivan, M. (2019). Developing deep understanding of teacher education practice through accessing and responding to pre-service teacher engagement with their learning. *Professional Development in Education*, 45(5), 832-847.

Font, R. (2009). A seminar on collaborative reflective practice for the professional development of Physical Education teachers: A proposal for education in values. *Cultura y Educacion*, 21(1), 81-94. doi:10.1174/113564009787531172

Garrett, R., & Wrench, A. (2008). Connections, pedagogy and alternative possibilities in primary physical education. *Sport, Education and Society*, 13(1), 39-60.

Gascoine, L., Higgins, S., & Wall, K. (2017). The Assessment of Metacognition in Children Aged 4-16 Years: A Systematic Review. *Review of Education*, 5(1), 3-57.

Retrieved from <http://search.ebscohost.com/login.aspx?direct=true&db=eric&AN=EJ1128708&lang=pt-br&site=ehost-live&scope=site>
<http://dx.doi.org/10.1002/rev3.3077>

Gibbs, G. (1998). Learning by doing; a guide to learning and learning methods. In: Oxford Further Education Unit, Oxford Polytechnic. UK.

Gillespie, L. B. (2011). Exploring the 'how' and 'why' of value orientations in physical education teacher education. *Australian Journal of Teacher Education*, 36(9), 2.

- Goldman, D. R. (2007). *A framework for video annotation, visualization, and interaction*.
- González-Calvo, G., & Fernández-Balboa, J.-M. (2018). A qualitative analysis of the factors determining the quality of relations between a novice physical education teacher and his students' families: implications for the development of professional identity. *Sport, Education and Society*, 23(5), 491-504.
- Goodnough, K. (2010). Teacher learning and collaborative action research: Generating a "knowledge-of-practice" in the context of science education. *Journal of Science Teacher Education*, 21(8), 917-935.
- Hains-Wesson, R., & Young, K. (2017). A collaborative autoethnography study to inform the teaching of reflective practice in STEM. *Higher Education Research & Development*, 36(2), 297-310.
- Harford, J., & MacRuairc, G. (2008). Engaging student teachers in meaningful reflective practice. *Teaching and Teacher Education*, 24(7), 1884-1892.
- Henderson, P., & Johnson, M. H. (2002). An innovative approach to developing the reflective skills of medical students. *BMC medical education*, 2(1), 1-4.
- Herbert, A. C., Ramirez, A. M., Lee, G., North, S. J., Askari, M. S., West, R. L., & Sommer, M. (2017). Puberty experiences of low-income girls in the United States: A systematic review of qualitative literature from 2000 to 2014. *Journal of Adolescent Health*, 60(4), 363-379.
- Hong, Q. N., Pluye, P., Fàbregues, S., Bartlett, G., Boardman, F., Cargo, M., . . . Nicolau, B. (2018). Mixed methods appraisal tool (MMAT), version 2018. *Registration of copyright*, 1148552, 10.
- Hsieh, H.-F., & Shannon, S. E. (2005). Three approaches to qualitative content analysis. *Qualitative health research*, 15(9), 1277-1288.
- Huber, J., Bogнар, B., & Mompoin-Gaillard, P. (2017). *Creating an online community of action researchers*: Council of Europe.
- Huu Nghia, T. L., & Tai, H. N. (2019). Preservice teachers' experiences with internship-related challenges in regional schools and their career intention: implications for teacher education programs. *Journal of Early Childhood Teacher Education*, 40(2), 159-176.
- Institute, T. J. B. (2014). Joanna Briggs Institute Reviewers' Manual: 2014 Edition. In: Joanna Briggs Institute Adelaide.
- Isik-Ercan, Z., & Perkins, K. (2017). Reflection for meaning and action as an engine for professional development across multiple early childhood teacher education contexts. *Journal of Early Childhood Teacher Education*, 38(4), 342-354.
- Jung. (2012). The focus, role, and meaning of experienced teachers' reflection in physical education. *Physical Education & Sport Pedagogy*, 17(2), 157-175.
- Keay, J. (2006). Collaborative learning in physical education teachers' early-career professional development. *Physical Education and Sport Pedagogy*, 11(3), 285-305.
- Keegan, R. (2016). Action research as an agent for enhancing teaching and learning in physical education: A physical education teacher's perspective. *Physical Educator*, 73(2), 255.
- Kember, D., McKay, J., Sinclair, K., & Wong, F. K. Y. (2008). A four-category scheme for coding and assessing the level of reflection in written work. *Assessment & Evaluation in Higher Education*, 33(4), 369-379.

doi:10.1080/02602930701293355

Khazaeenezhad, B., Tavakoli, M., & Amirian, Z. (2018). Making sense of core qualities to sustain professional development through core reflection practice. *Journal of Teacher Education for Sustainability*, 20(1), 93-105.

Kirk, & Macdonald. (1998). Situated learning in physical education. *Journal of Teaching in Physical Education*, 17, 376-387.

Kirk, D., MacDonald, D., & O'Sullivan, M. (2006). *Handbook of physical education*: Sage.

Körkkö, M., Kyrö-Ämmälä, O., & Turunen, T. (2016). Professional development through reflection in teacher education. *Teaching and Teacher Education*, 55, 198-206.

Korthagen, F., & Vasalos, A. (2005). Levels in reflection: Core reflection as a means to enhance professional growth. *Teachers and Teaching*, 11(1), 47-71.

Lamb, P. (2015). Peer-learning between pre-service teachers: embracing Lesson Study. *International Journal for Lesson and Learning Studies*.

Lamb, P., Ko, P. Y., & Aldous, D. (2016). Exploring the relationship between reflexivity and reflective practice through lesson study within initial teacher education. *International Journal for Lesson and Learning Studies*.

Lamb, P., Lane, K., & Aldous, D. (2013). Enhancing the spaces of reflection: A buddy peer-review process within physical education initial teacher education. *European Physical Education Review*, 19(1), 21-38.

Larrivee, B. (2010). What we know and don't know about teacher reflection. *The purposes, practices, and professionalism of teacher reflectivity: Insights for twenty-first-century teachers and students*, 137-162.

Lasheras, I. N., Arruabarrena, O. U., García, D. M., & Standal, O. F. (2019). Comprensión de la habilidad desde la perspectiva del futuro profesorado de Educación Física. *Retos: nuevas tendencias en educación física, deporte y recreación*(36), 121-128.

Lave, J., & Wenger, E. (1991). *Situated learning: legitimate peripheral participation*. Cambridge: Cambridge University Press.

Leeferink, H., Koopman, M., Beijard, D., & Ketelaar, E. (2015). Unraveling the complexity of student teachers' learning in and from the workplace. *Journal of Teacher Education*, 66(4), 334-348.

Ling, W. (2018). On the Content of the Pre-service Teachers' Teaching Reflection in the Practicum. *Theory & Practice in Language Studies*, 8(9), 1195-1199. doi:10.17507/tpls.0809.13

Liu, K. (2015). Critical reflection as a framework for transformative learning in teacher education. *Educational Review*, 67(2), 135-157.

MacPhail, A., Patton, K., Parker, M., & Tannehill, D. (2014). Leading by example: Teacher educators' professional learning through communities of practice. *Quest*, 66(1), 39-56.

MacPhail, A., & Sohun, R. (2019). Interrogating the enactment of a service-learning course in a physical education teacher education programme: Less is more? *European Physical Education Review*, 25(3), 876-892.

Marzano, R. J. (2012). *Becoming a reflective teacher*. Solution Tree Press.

Melnychuk, N. (2001a). A Cohort Practicum Model: Physical Education Student Teachers' Experience. *Alberta Journal of Educational Research*, 47(3), 259-275. Retrieved from

- <http://search.ebscohost.com/login.aspx?direct=true&AuthType=ip,uid&db=eric&AN=EJ639801&lang=pt-pt&site=ehost-live&scope=site>
- Melnychuk, N. (2001b). A cohort practicum model: Physical education student teachers' experience. *Alberta journal of educational research*, 47(3).
- Mesquita. (2014). Mudança de paradigma na formação de treinadores: o valor da aprendizagem experiencial. In P. Batista, A. Graça, & P. Queirós (Eds.), *O estágio profissional na (re)construção da identidade profissional em Educação Física* (Vol. 333-359). Porto: Editora da U. Porto Faculdade de Desporto.
- Mesquita, Borges, M., Rosado, A., & Batista, P. (2012). Self-efficacy, perceived training needs and coaching competences: The case of Portuguese handball. *European Journal of Sport Science*, 12(2), 168-178.
- Mesquita, Coutinho, De Martin-Silva, L., Parente, B., Faria, M., & Afonso, J. (2015). The value of indirect teaching strategies in enhancing student-coaches' learning engagement. *Journal of Sports Science & Medicine*, 14(3), 657.
- Messiou, K. (2019). Collaborative action research: facilitating inclusion in schools. *Educational Action Research*, 27(2), 197-209.
- Miller, K., & Zhou, X. (2007). *Learning from classroom video: What makes it compelling and what makes it hard*: na.
- Moody, J. (2009). Key elements in a positive practicum: Insights from Australian post-primary pre-service teachers. *Irish Educational Studies*, 28(2), 155-175.
- Moon. (2004). *A handbook of reflective and experimental learning: Theory and Practice*. London: Routledge.
- Moon. (2007). *Critical thinking: An exploration of theory and practice*: Routledge.
- Mooney, A., & Hickey, C. (2017). '(Dis) empowered by what we see...': exploring the use of video-stimulated reflection in physical education pedagogy and practice. *Asia-Pacific Journal of Health, Sport and Physical Education*, 8(3), 229-244.
- Nagle, J. F. (2008). *Becoming a reflective practitioner in the age of accountability*. Paper presented at the The Educational Forum.
- O'Brien, B. C., Harris, I. B., Beckman, T. J., Reed, D. A., & Cook, D. A. (2014). Standards for Reporting Qualitative Research: A Synthesis of Recommendations. *Academic Medicine*, 89(9), 1245-1251. doi:10.1097/acm.0000000000000388
- Osmanović-Zajić, J., & Maksimović, J. Ž. (2020). Contemporary teachers' action research: Basis for the development of reflective practice in education. *Istraživanja u pedagogiji*, 10(2), 354-366.
- Østergaard, L. D. (2019). Creation of new routines in physical education: second-order reflection as a tradition-challenging form of reflection stimulated by inquiry-based learning. *Sport, Education and Society*, 24(9), 981-993.
- Page, M. J., McKenzie, J. E., Bossuyt, P. M., Boutron, I., Hoffmann, T. C., Mulrow, C. D., . . . Brennan, S. E. (2021). The PRISMA 2020 statement: an updated guideline for reporting systematic reviews. *Bmj*, 372.
- Peralta, L. R., Bennie, A., Gore, J., & Lonsdale, C. (2020). An Investigation of the Influence of Video Types and External Facilitation on PE Inservice Teachers' Reflections and Their Perceptions of Learning: Findings From the AMPED Cluster Controlled Trial. *Journal of Teacher Education*. doi:10.1177/0022487120964079
- Pike, P. D. (2015). Using a synchronous online teaching internship to develop

- pedagogical skills and explore teacher identity: A case study. *Journal of Music, Technology & Education*, 8(3), 227-242.
- Playsted, S. (2019). Reflective practice to guide teacher learning: A practitioner's journey with beginner adult English language learners.
- Porritt, K., Gomersall, J., & Lockwood, C. (2014). JBI's systematic reviews: study selection and critical appraisal. *AJN The American Journal of Nursing*, 114(6), 47-52.
- Richardson, V. (1990). Significant and worthwhile change in teaching practice. *Educational Researcher*, 19(7), 10-18.
- Riesenberg, L. A., & Justice, E. M. (2014). Conducting a successful systematic review of the literature, part 1. *Nursing2020*, 44(4), 13-17.
- Rogers, R. R. (2001). Reflection in Higher Education: A Concept Analysis. *Innovative Higher Education*, 26(1), 37-57. doi:10.1023/a:1010986404527
- Ruffinelli, A., de la Hoz, S., & Álvarez, C. (2020). Practicum tutorials in initial teacher training: conditions, strategies, and effects of reflective practice. *Reflective Practice*, 21(1), 54-67.
- Saavedra Jeldres, P. A., & Campos Espinoza, M. (2019). Chilean Pre-Service Teachers' Perceptions Towards Benefits and Challenges of EFL Writing Portfolios. *Profile Issues in Teachers Professional Development*, 21(2), 79-96.
- Saccomano. (2013). Refining Pre-service Teachers' Teaching Capacity with Adolescent Students Through the Use of Reflective Practice. *California Reader*, 47(2).
- Schön, D. A. (1983). *The reflective practitioner*. Nova York: Basic Books.
- Schön, D. A. (1987). *Educating the reflective practitioner*. San Francisco, CA: Jossey-Bass.
- Senne, & Rikard. (2002). Experiencing the portfolio process during the internship: A comparative analysis of two PETE portfolio models. *Journal of Teaching in Physical Education*, 21(3), 309-336.
- Senne, & Rikard. (2004). A developmental intervention via the teaching portfolio: Employing the teaching/learning framework. *Journal of Teaching in Physical Education*, 23(1), 88-104.
- Sherin, M. G., & Han, S. Y. (2004). Teacher learning in the context of a video club. *Teaching and Teacher Education*, 20(2), 163-183.
- Standal, Ø. F., & Moe, V. F. (2013). Reflective Practice in Physical Education and Physical Education Teacher Education: A Review of the Literature Since 1995. *Quest*, 65(2), 220-240. doi:10.1080/00336297.2013.773530
- ten Dam, G. T., & Blom, S. (2006). Learning through participation. The potential of school-based teacher education for developing a professional identity. *Teaching and Teacher Education*, 22(6), 647-660.
- Thomas, G. J. (2005). Dimensions of facilitator education. *The IAF handbook of group facilitation: Best practices from the leading organisation in facilitation*, 525-541.
- Timoššuk, I., & Ugaste, A. (2010). Student teachers' professional identity. *Teaching and Teacher Education*, 26(8), 1563-1570.
- Tsangaridou, & Polemitou. (2015). Exploring pre-service classroom teachers' reflections on teaching physical education. *European Physical Education Review*, 21(1), 66-82.
- Tsangaridou, N., & Siedentop, D. (1995). Reflective Teaching: A Literature

- Review. *Quest*, 47(2), 212-237. doi:10.1080/00336297.1995.10484153
- Tülüce, S. (2016). Scrutinizing practicum for a more powerful teacher education: A longitudinal study with pre-service teachers. *Educational Sciences: Theory and Practice*, 16(1), 127-151.
- Ussher, B., & Chalmers, J. (2011). Now what? First year student teachers' reflective journal writing. *Waikato Journal of Education*, 16(3).
- Van Manen, M. (1991). Reflectivity and the pedagogical moment: The normativity of pedagogical thinking and acting. *J. Curriculum Studies*, 23(6), 507-536.
- Vivekananda-Schmidt, P., Marshall, M., Stark, P., Mckendree, J., Sandars, J., & Smithson, S. (2011). Lessons from medical students' perceptions of learning reflective skills: a multi-institutional study. *Medical Teacher*, 33(10), 846-850.
- Ward, P., Kim, I., Ko, B., & Li, W. (2014). Effects of Improving Teachers' Content Knowledge on Teaching and Student Learning in Physical Education. *Research Quarterly for Exercise and Sport*, 0, 1-10.
- Watts, L. (2019). Reflective practice, reflexivity, and critical reflection in social work education in Australia. *Australian Social Work*, 72(1), 8-20.
- Wedman, J. M., Espinosa, L. M., & Laffey, J. M. (1999). A process for understanding how a field-based course influences teachers' beliefs and practices. *The Teacher Educator*, 34(3), 189-214.
- Wenger, E., McDermott, R., & Snyder, W. M. (2002). *Cultivating communities of practice: a guide to managing knowledge*. Massachusetts: Harvard Business Press.
- Whittle, R. J., Telford, A., & Benson, A. C. (2018). Teacher's perceptions of how they influence student academic performance in VCE physical education. *Australian Journal of Teacher Education*, 43(2), 1.
- Wink, J., & Putney, L. (2002). *A vision of Vygotsky*. London: Allyn & Bacon.
- Winkel, A. F., Yingling, S., Jones, A.-A., & Nicholson, J. (2017). Reflection as a Learning Tool in Graduate Medical Education: A Systematic Review. *Journal of Graduate Medical Education*, 9(4), 430-439. doi:10.4300/JGME-D-16-00500.1
- Zajic, J. O., & Maksimovic, J. (2020). CONTEMPORARY TEACHERS' ACTION RESEARCH -- BASIS FOR THE DEVELOPMENT OF REFLECTIVE PRACTICE IN EDUCATION. *Research in Pedagogy / Istrazivanja u Pedagogiji*, 9(2), 354-366. doi:10.5937/IstrPed2002354O
- Zhu. (2011). Student teachers' reflection during practicum: Plenty on action, few in action. *Reflective Practice*, 12(6), 763-775.
- Zhu, X. (2011). Student teachers' reflection during practicum: Plenty on action, few in action. *Reflective Practice*, 12(6), 763-775. doi:10.1080/14623943.2011.601097

Theoretical Essay

A step forward on the journey of pre-service teachers becoming reflective practitioners.

Um passo à frente na jornada de estudantes-estagiários que se tornam práticos reflexivos

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Resumo

A Educação física tem vindo a reconhecer cada vez mais o papel da reflexão no desenvolvimento profissional e na formação dos estudantes-estagiários (EEs). Embora a capacidade de reflexão seja crucial para questionar crenças e desconstruir experiências, muitos EEs encontram dificuldades em desenvolver eficazmente meios que aprimorem essa capacidade. Assim, este ensaio teórico tem dois objetivos principais: primeiro, examinar como a reflexão dos EEs pode ser desenvolvida, particularmente no contexto do estágio, e qual o valor da prática reflexiva no desenvolvimento profissional dos EEs; segundo, explorar o papel da reflexão crítica na transformação dos EEs em práticos reflexivos, bem como elencar as estratégias reflexivas promotoras desse desenvolvimento. Com base neste ensaio, reconhecemos que, para se tornarem práticos reflexivos, os EEs devem ser capazes de interpretar os problemas que emergem no estágio à luz da interação dinâmica entre os momentos e os níveis de reflexão. Por sua vez, os programas de formação de professores devem suportar este processo de forma explícita, intencional e continua.

Palavras-chave: reflexão crítica, scaffolding, reflexão-na-ação, estudantes-estagiários

Abstract

In the field of Physical Education, there is a growing recognition of the role of reflection in both professional development and the education of pre-service teacher (PSTs). The capacity for reflection is deemed essential for the critical examination of one's beliefs and the deconstruction of experiences. Nevertheless, many PSTs encounter difficulties in effectively honing this skill. The objectives of this theoretical essay are twofold. First, it seeks to examine the mechanisms through which PSTs can develop their reflective abilities, particularly within the practicum context. Furthermore, it aims to evaluate the value of reflective practice in the context of their professional development. The second objective is to explore the role of critical reflection in the transformation of PSTs

into reflective practitioners, striving to identify the strategies that facilitate this transformation. The analysis presented in this essay revealed that in order for PSTs to become reflective practitioners, they must be proficient at interpreting the challenges that arise during their practicum. This interpretative process is shaped by the dynamic interplay between moments and levels of reflection. Consequently, teacher education programs should adopt an explicit, intentional, and sustained approach in supporting this process.

Keywords: critical reflection, scaffolding, reflection-in-action, pre-service teachers.

Introduction

Over the past decade, the practice of reflection has increasingly become a central component in teacher education programs worldwide to help pre-service teachers (PSTs) optimize their teaching praxis (Alsuhaibani, 2019). In the process of becoming a teacher, reflection serves as a powerful tool, encouraging PSTs to interpret their practical experiences and discern areas for improvement in their future actions. Beyond its utility in helping PSTs find pedagogical solutions, reflection also holds particular significance in shaping PSTs' teaching and learning beliefs (Peralta et al., 2021). This significance is especially pronounced in the context of physical education teacher education (PETE), where PSTs are required to question their beliefs about the subject matter and deconstruct their prior experiences (Fletcher & Kosnik, 2016). When PSTs learn to reflect, they gain insight into their own thought processes and teaching methods. Nevertheless, teachers, particularly those of Physical Education (PE), often tend to adopt a traditionalist approach that emphasizes replication over innovation. This tendency results from a lack of the necessary reflective thinking that can challenge established teaching practices, a concern that should be addressed in PETE (Tinning, 2016).

As a result, there is a need for PSTs, particularly within the domain of PE, to enhance their self-awareness and understand how their devised solutions are related to other ideas and past experiences in order to promote professional development. The cultivation of this process is facilitated through critical reflection², wherein practical experiences are systematically transformed into personal understanding (Schön, 1995). This allows PSTs to explore their "personal and professional belief systems" (Larrivee, 2008, p. 343). Consequently, critical reflection enables PSTs to scrutinize their practices, ultimately leading to the departure from a prescriptive style of teaching (Aartun et al., 2022).

²“Critical reflection involves questioning established assumptions about teaching and learning, as well as the social and political aspects of education, in order to improve student learning and promote a more just society” Liu. (2015). Critical reflection as a framework for transformative learning in teacher education. *Educational Review*, 67(2), 135-157. <https://doi.org/https://doi.org/10.1080/00131911.2013.839546> .

However, the process of critical reflection can be quite demanding, particularly for PSTs whose beliefs, assumptions, and values are continually being challenged (Larrivee, 2008). A central emphasis in PETE programs is the integration of authentic practical experiences into the training of PSTs (Østergaard, 2019). Notably, the crucible of teaching practice constitutes the essential elements responsible for stimulating the development of critical reflection in PSTs. Consequently, through the application of reflective practice³, PSTs acquire the capacity to analyze, interpret, and evaluate their teaching experiences with the intention of improving their future practice (Farrell, 2016a; Mathew & Peechattu, 2017).

Although PETE programs aim to foster critical reflection within PSTs, it is evident that these programs typically lack a structured framework for facilitating this process (Zhu, 2011). Therefore, to meet the complex and inherent demands of critical reflection, it is imperative for PETE programs to create structures that “explicitly, directly, thoughtfully and patiently” (Russell, 2005, p. 203) support PSTs in their development. Furthermore, the provision of support in PETE programs should extend to the development of reflective skills aimed at enhancing the quality of PSTs’ critical reflection and the implementation of strategies to improve their reflective processes.

In this regard, the use of reflective strategies to cultivate structured and critical reflective abilities of PSTs has been recognized (Lamb, 2015). Consequently, a range of strategies (e.g., video commentary, diary writing, or observation) have been revealed in the context of PETE programs as mechanisms to promote the development of PSTs’ reflective processes (Azevedo et al., 2022).

Therefore, this theoretical essay serves a dual purpose. Firstly, we attempt to examine the cultivation of reflection in PSTs and the significance of reflective practice in their professional development. Secondly, we aim to explore the role of critical reflection in shaping PSTs into reflective practitioners and the

³ Reflective practice builds upon the concepts of reflective teaching and teacher inquiry, drawing from the work of Schön (1987) and Dewey (1933) to enhance critical thinking and improve teaching practice (Han et al., 2017).

contribution of reflective strategies in the development of their critical reflection capacities.

Unfolding the role of reflection in PSTs' professional development

In contemporary teacher education programs worldwide, reflection has emerged as a central and integral component (Buschor & Kamm, 2015). That said, the concept of reflection has acquired several definitions within the educational literature (Clarà, 2015). In this regard, one of the most prominent early contributions in education was undoubtedly made by John Dewey (1933b) in his book, "How We Think"⁴. Subsequently, the popularization of reflection as a guiding principle in teacher education was championed by Donald Schön, particularly evident in his book "The Reflective Practitioner" (1983), where reflection emerged as the "grand idée" in teacher education (Jay & Johnson, 2002, p. 73).

Drawing on these works, a variety of definitions of reflection have proliferated within the literature (Ruffinelli, de la Hoz, & Álvarez, 2020). For example, researchers have offered varying interpretations of reflection, characterizing it as an attempt to grasp the fundamental essence of something (Kansanen, 1995), as a "positive embracing of the doubts" (Gursansky et al., 2010, p. 779), or as a cognitive process used to understand complex and ambiguous problems (Cushion, 2018). The most current definition of reflection, presented in a systematic review by (Marshall, 2019), refers to "[...] a careful examination and bringing together of ideas to create new insight through ongoing cycles of expression and re/evaluation" (p. 411).

Accordingly, in the context of practical experience, reflection is typically instigated by unforeseen events and requires a structured approach involving (a) a description of the situation, (b) the revelation and questioning of initial insights and assumptions, (c) and an attitude of openness, responsibility, and holistic perspective (Dewey, 1933b; Schön, 1987; Valli, 1997). Such an approach

⁴ In *How We Think*, a book in which Dewey, J. (1933b, 06/19/). *How We Think* [Book Review]. *Journal of Education*, 116(12), 321-321. <http://search.ebscohost.com/login.aspx?direct=true&AuthType=ip,uid&db=lls&AN=22029848&lang=pt-pt&site=ehost-live&scope=site> explored what distinguishes thinking – a basic human skill we take for granted – from thinking well, what we need to do to master the art of thinking, and how we can channel our natural curiosity in productive ways when faced with an excess of information.

facilitates the transformation of circumstances in a way that helps PSTs navigate through uncertainty (Attar et al., 2016). Thus, formative efforts can be continually improved, and the process of reflection can manifest at various levels (Manen, 1991) including:

1. **Technical level:** At this level, the primary concern is with applying knowledge to achieve predetermined educational goals. The ultimate goals are generally accepted without question. The actions taken are evaluated based on their effectiveness, economy, and efficiency.
2. **Deliberative level.** Moving beyond technical rationality, individuals at this level engage in a more profound examination of, and questions about, the ultimate goals and the underlying assumptions that guide instructional activities designed to achieve them.
3. **Critical level.** At this level, individuals extend their reflections beyond the immediate goals, activities, and assumptions, to consider the broader context in which all education is situated. This level of reflection includes moral and ethical considerations

Throughout the PETE programs, it is both expected and desirable that PSTs progress toward a higher level of reflection, specifically by developing critical reflection skills. Therefore, having an understanding of the various levels of reflection enables PSTs to situate themselves, (i.e., to determine their current level) and formulate strategies to enhance the depth and quality of their reflection. This way, PSTs can appreciate the impact of reflection on their personal and professional growth and how it contributes to their success. While PSTs may tend to associate reflection with simply observing or describing events, it is crucial to highlight that merely reporting what another teacher observes is not equivalent to engaging in the reflective process. This is consistent with findings from previous research. When teachers are encouraged to engage in reflection, they often mistakenly equate it with providing a meticulous account of all their actions during their teaching-learning practice (Robinson & Rousseau, 2018). This can be problematic if it leads to rumination⁵. This situation typically occurs because PSTs

⁵ Rumination is when reflection is characterized by negative effects, such as blocking action, loss of spontaneity, pessimism and falling into a bottomless pit of reflection upon reflection Van Woerkom, M. (2010). Critical reflection as a rationalistic ideal. *Adult Education Quarterly*, 60(4), 339-356. .

often lack a full grasp of the concept of reflection. Therefore, it is imperative to clarify and deepen their understanding of what reflection truly entails (Jay & Johnson, 2002).

Without a clear understanding of the significance of reflection and how these goals are integrated into PETE programs by teacher educators, reflection can devolve into a superficial experience aimed solely at meeting externally imposed criteria (Nelson & Sadler, 2013). More specifically, within PETE programs, it is essential to promote cognitive processes such as critical analysis, synthesis, evaluation, documentation, sense-making, knowledge integration, and future-oriented planning. These cognitive activities are vital for PSTs to develop their reflective abilities (Boud et al., 2006; Vivekananda-Schmidt et al., 2011), including drawing on cognition to understand, interpret, and question their own practice problems.

Thus, future research should adopt a critical and skeptical approach when assessing the actions already undertaken and those that remain necessary to facilitate the development of critical reflection in PSTs (Fendler, 2003). To explore current practices it is essential to examine, “field experiences” (i.e., practical experiences related to professional practice). This is where PSTs can gain real-world experiences that can be nurtured through reflective practice.

Diving into interpretation of pedagogical practice: the value of reflective practice

The value of reflecting within the practice begins with the acknowledgment of what Schön (Schön, 1983) terms the “indeterminate zones of practice⁶”, which are often encountered by professionals in their daily work. Consequently, the practice environment serves as the fertile ground where PSTs can gather essential “fuel” (i.e., data, problems, and dilemmas) to facilitate their reflective processes. Thus, practice acts as a catalyst for reflection.

In teacher education, reflective practice is widely regarded as the hallmark of a professional educator and is integral to the quality of teaching and learning

⁶ Schön, D. A. (1983). *The reflective practitioner*. Basic Books. suggests that the majority of practice is characterized by such indeterminate zones, situations that are not “in the book” and which do not respond in clear-cut ways to the application of technical or scientific evidence.

(Huntley, 2008). Schön describes reflective practice as a process akin to “trial and error” (1983, p. 27), wherein practitioners cannot simply adhere to textbook schemes. This is why Schön refers to reflection as the “art” (1983, p. 50) of teaching experiences that practitioners consider most appropriate for their own reflective process. Larrivee (2008) delineates reflective practice as the practical implementation that arises from applying a reflective approach to daily decision-making and problem-solving in the workplace. Similarly, Bolton (2010) posits that reflective practice represents the most effective strategy in education because it enables teachers to glean insights from their experiences and continually develop their professional knowledge and skills. While various definitions of reflective practice have emerged over recent decades, they all share a common objective: delineating a learning process rooted in the interpretation, examination, and understanding of one’s professional practice.

In the practical realm of PETE, PSTs frequently encounter a phenomenon known as “reality shock”: a consequence of transitioning from their initial training to actual teaching. During this phase, PSTs often find themselves deviating from the pedagogical principles they learned during their educational journey and resorting to survival strategies as a means of coping with the challenges inherent to being inexperienced teachers (Macken, MacPhail, & Calderon, 2020; Shoal, Erlich, & Fejgin 2010).

This trend can be effectively reversed when PSTs engage in reflective practice, as it encourages them to interpret their practice experiences through the lens of theory. This process facilitates heightened awareness and a deeper understanding of significant personal and professional matters (Moon, 2004). As PSTs develop their reflective practice, they gain the ability to contemplate their own teaching practices and apply their acquired knowledge and learning to address the challenges that emerge within their field (Suphasri & Sumalee, 2021).

Throughout reflective practice, PSTs should progressively advance their reflection to a point where they can integrate the capacity to think, decide, and act - that is, achieve critical reflection. Consequently, when PSTs engage in critical reflection regarding their teaching practice, they incorporate themselves into the interpretation of their experiences, a pivotal element for their professional

growth. To comprehensively deconstruct experiences and capture all the valuable insights gained from practice, PSTs must examine various moments throughout their teaching journey (Miller, 2022). The interplay and development of these temporal dynamics of reflection can assist PSTs in assigning meaning to their pedagogical experiences, thereby enhancing their ability to critically self-assess their practice (Ravanal Moreno et al., 2021). Particularly within the complex and ever-changing context of PE (McEvoy et al., 2015), PSTs are required to make impromptu decisions, not only based on the current moment but also informed by insights gleaned from past experiences.

Several studies have argued that the timing of reflection holds distinctive insights into practice (Cavanagh & McMaster, 2015; Gadsby, 2022) and contributes to enhancing the depth and quality of reflection.

- Accordingly, practice occurs in real-time, so when PSTs *reflect-in-action* they can “note something of potential value in the midst of their current activity, and pinpoint what that might usefully add to their ability or understanding, in future” (Schön, 1987, pp. 27–29).
- However, for their practice to be effectively examined, PSTs must engage in both pre-practice and post-practice thinking. In other words, PSTs need to *reflect-on-action* where they “look back over a recent experience or experiences and identify what they can take from that, which will usefully enhance their ability or understanding” (Moon, 2013, p. 33).
- Additionally, PSTs should *reflect-for-action*, a process in which they “consider and choose between options in response to forthcoming demands, and plan accordingly” (Cowan, 2006, pp. 50-55).
- Furthermore, PSTs should also develop a practice of *reflection-on-reflection-in-action*. This involves a retrospective examination of their in-action reflection, understanding what occurred during the reflection, paying attention to observations, the meanings they ascribed at that moment, and exploring alternative interpretations (Schön, 1987).

The current existing research does not definitively establish a perfect moment for PSTs’ reflection. However, the majority of reflection exercises designed for PSTs are retrospective, requiring them to process events at a later

point in time (Umutlu & Kim, 2020). This type of reflection relies on PSTs' memory to recall complex experiences, including emotions, specific statements or comments, detailed thought processes, and behavioral responses (Anderson, 2014; Schon, 1987). Conversely, reflection-in-action is considered the most desirable yet challenging form of developing reflection in PSTs (Umutlu & Kim, 2020). This form of reflection engages an unconscious information processing system that encompasses unspoken practices, various forms of thinking, and creativity.

Hence, the experiences of PSTs offer a valuable avenue for developing reflection (Sicora, 2019). However, PETE programs should not only acknowledge reflection-in-action and reflection-on-action but also all the above-mentioned reflection moments and the dynamic interplay between them. These programs must recognize the inherent value within each reflection moment, as each holds distinct characteristics that contribute to the development of critical reflection among PSTs.

Future research should concentrate on exploring how to effectively cultivate and integrate the various reflection moments among PSTs. The rationale behind this focus is that the classroom is a complex and constantly changing environment, where PSTs must make spontaneous decisions based on reflection-in-action. These decisions are shaped by what is happening in the present moment, as well as insights derived from reflections at other moments. Reflective practice equips PSTs with the tools to navigate the complexities of the classroom by facilitating an intricate interplay of different types and moments of reflection. These distinct modes, each with unique attributes and challenges, collectively enhance PSTs' capacity to make well-informed, real-time decisions (Schön, 1987; Moon, 2013; Cowan, 2006). By embracing this dynamic synergy of reflective moments, PETE programs can more effectively prepare PSTs with the critical reflection skills necessary for effective teaching. Future research should concentrate on optimizing this blend of reflection types to elevate educational quality to its maximum potential.

Flourishing and maturing in the chaos of complex practice: the role of critical reflection

Research findings suggest that PE PSTs often limit themselves to technical-level reflection, although reflective practice calls for PSTs to delve into interpretation, problematization, and the pursuit of fresh perspectives in their teaching practice (Azevedo et al., 2022). By actively engaging in critical reflection, PSTs can elevate their understanding by incorporating moral, ethical, and self-awareness considerations, along with perspectives concerning others and the context, into their evaluations and discussions related to the dimensions of teaching education (Van Manen, 1977; Zeichner & Liston, 1987).

Over recent years, numerous definitions of critical reflection have emerged in the literature (Liu, 2015). For example, Valli (1997) posits that critical reflection comprises two significant dimensions: content and quality. Valli elucidates that PSTs must discern both what they think (content) and the manner in which they contemplate that content (quality) to ascertain whether they are making good decisions. Building on this, Liu (2015) incorporated the goal (why reflect), the process (how to reflect), and the content (what to reflect upon) into his definition of critical reflection. Beyond content, quality, and goal, it is also essential to note that critical reflection is influenced by the temporal dynamics of reflection and self-analysis. This introspective element yields valuable insights into the practice of PSTs.

Cowan and Stroud (2016) introduced the concept of *composting reflection*, which integrates the previously discussed aspects of critical reflection. They describe composting reflection as the act of “*re-encounter[ing] for some reason an existing collection of past experiences, ideas, issues and possibilities upon which they have already reflected, but which they may never have adequately followed up*” (Cowan & Stroud, 2016). Through composting reflection, PSTs are not merely revisiting their past thoughts to jog their memories. Instead, they are making a deliberate effort to scrutinize and reassess those earlier reflections, converting them into valuable insights that can address the immediate concerns and needs of PSTs. The central question guiding this composting reflection becomes: “*How might these past reflections enrich and make more fertile the*

reflection-for-action or reflection-on-action which I currently have, or should have, in hand?" (Cowan & Stroud, 2016, p. 29).

Thus, PSTS must engage in critical reflection, incorporating various moments and approaches, including composting reflection. While PSTs are capable of reflection, it's essential to note that not all reflection is inherently critical (Mezirow, 1990a). Without a deep understanding of the content of their reflections, PSTs may struggle to determine whether their reflections are merely technical or genuinely critical. It is entirely plausible for PSTs to become overly focused on the technical and logistical aspects of the learning-teaching process, neglecting a deeper comprehension of the underlying dynamics and their implication. The transformation of reflection into critical reflection primarily hinges on introspective questioning of oneself, the context, and interactions with others.

Therefore, PSTS must internalize the "what" (content), "how" (processes), and "why" (goals) of their actions, while also embracing the diverse moments of reflection, which include the temporal dynamics of reflection. These aspects should be in constant interaction with the various contexts in which they practice (i.e., social, cultural, economic). By undertaking this approach, PSTs can transform reflective practitioners who are in a constant state of evolution, capable of considering a broader range of possible choices and responses (Larrivee, 2008). This perspective is fundamental because for PSTs in PE to grasp the complexity of critical reflection, they must cultivate adaptable and flexible thinking. Consequently, PSTs gain the ability to explore multiple solutions to the challenges they encounter in their practice, rather than fixating on a single solution.

Consequently, PETE programs must accept and embrace the inherent complexity of critical reflection to enable PSTs to develop an awareness of this intricacy. Simultaneously, the discourse surrounding critical reflection in research should mirror the same attitude needed to reach this heightened level of

reflection. This entails rejecting a dualistic approach⁷ and instead adopting a relativist learning approach⁸ (Entwistle & Entwistle, 1991).

As a result, future research must encourage the incorporation of multiple perspectives and diverse discourses within teacher education. This approach is essential, as it not only cultivates critical reflection but also equips PSTs with the capacity to function professionally and autonomously, capable of adapting to the specific challenges within their practice environments without over-reliance on predetermined plans. Hence, scientific literature has attempted to identify approaches that promote critical reflection among PSTs (Zhu, 2011), thereby enabling the development of guidelines and concrete strategies to assist PSTs in interpreting their practice.

Pedagogical tools to promote critical reflection in pre-service teachers: a path to knowledge

The literature concerning PETE has offered several approaches to facilitate the development of critical reflection in PSTs. These approaches include the use of (i) reflective strategies, such as video commentaries, reflective logs, and observations (Tsangaridou & O'Sullivan, 1994), (ii) reflective activities, such as assigned readings, teaching videos, and teaching experiences (Nagro & deBettencourt, 2019), and (iii) reflective tools, such as video-stimulated reflection (Mooney & Hickey, 2017). Despite their similarities, it is important to highlight the nuances that exist within these categories.

Reflective strategies encompass specific methods or techniques designed to foster reflection, which can be implemented either independently or synergistically. These strategies tend to be intrapersonal, concentrating on an individual PST's own self-assessment and personal growth – examples include keeping a reflective journal or making video commentaries about a lesson. In contrast, reflective activities represent more expansive and didactic approaches,

⁷ It assumes a dichotomous understanding of the world and reality and consequently leads to a simplified understanding in which there is only one place for "antagonistic" positions (i.e., right/wrong), since knowledge is understood as absolute facts Entwistle, & Entwistle. (1991). Contrasting forms of understanding for degree examinations: the student experience and its implications. *Higher Education*, 22, 205-227. .

⁸ It assumes a complex understanding of the world and reality (i.e., several realities coexist), leading to an understanding that corresponds to the complexity of the phenomena analyzed (i.e., there is a place beyond right/wrong) Ibid..

emphasizing external observation and instructional processes. Such activities might integrate various strategies and tools within a sophisticated teaching sequence, such as analyzing a series of instructional videos followed by group discussions. Concurrently, reflective tools refer to particular instruments or platforms that aid the execution of strategies or activities. This includes online platforms where PSTs can share their reflective journals or methodological observation checklists used during classroom assessments.

Regardless of their specific focus, each of these categories functions as pedagogical tools, offering differing levels of structure in their objective to enhance the reflective development of PSTs. Notably, the most prevalent tools are associated with written reflection and the observation of instructional PSTs' practices (Azevedo et al., 2022). Recently, technology has progressively modernized the process of written reflection among PSTs, with the introduction of tools such as *blogs* (O'Reilly & Milner, 2020).

Blogs are best described as online platforms where PSTs regularly share insights on a central topic, resembling the format of a journal (Yang & Chang, 2012). An important feature of blogs is their capacity to extend discussions beyond the confines of traditional face-to-face classroom interactions. This not only offers flexibility in timing but also sustains the discourse over time, fostering deeper, more comprehensive exchanges that incorporate diverse perspectives in an informal setting (Hall, 2018). In parallel, video observation of PSTs' practices provides a more holistic view of their teaching (Walshe & Driver, 2019) and aids in deconstructing their pedagogical approaches (Newhouse, Lane, & Brown, 2007).

Videos prove to be particularly valuable for PSTs, especially when they encounter uncertainty in understanding various classroom scenarios. Consequently, videos serve as a valuable tool for PSTs, facilitating their self-reflection on teaching practices and providing a platform for feedback from peers or experienced teachers (Lee & Wu, 2006). Furthermore, the use of classroom-recorded videos greatly enhances the ability of PSTs to reflect on classroom events. This is accomplished by encouraging PSTs to actively engage in the observation of instruction processes (Crawford, O'Reilly, & Luttrell, 2012), and

aiding them in identifying details they might otherwise overlook (Zhang, Lundeborg, Koehler, & Eberhardt, 2011).

Conversely, in the literature on PETE, reflective practices have been delineated in conjunction with pedagogical tools, investigating avenues that might help enhance the practical teaching skills of PSTs (Erdemir & Yeşilçınar, 2021). Specifically, these include, (i) teacher feedback, characterized as a unilateral stream of direct suggestions (Akcan & Tatar, 2010, p. 165); (ii) peer feedback, where peers engage collaboratively to offer constructive criticism (Karagiorgi, 2011); and (iii) self-reflection, an autonomous and conscious process where PSTs analyze their work (Tillema, 2010).

Along with the use of pedagogical tools, scaffolding⁹ should be applied to promote the development of critical reflection. Scaffolding involves providing explicit and structured support to PSTs over time (Mesquita et al., 2023). In this context, facilitators, such as supervisors, play a crucial role. By engaging in meaningful dialogue and active listening, they empower PSTs to navigate the complexities of their practice, thereby fostering critical decision-making practice skills (Farias et al., 2018; T. Marshall et al., 2022).

Consequently, scaffolding should underpin the development of critical reflection in PSTs. The intensity of teacher guidance should be adjustable and tailored to the individual needs of PSTs (i.e., the use of more guidance-based instruction) (Farias et al., 2018). For example, if PSTs do not know how to reflect critically, PETE programs should provide initial guidelines, structure, and even prescriptive measures. However, an overly prescriptive approach might inadvertently limit PSTs, preventing them from adopting a truly critical perspective.

Reflection, when not properly structured or guided, can be a complex and daunting challenge for PSTs, especially when they lack the essential skills for self-analysis and student assessment. This situation exacerbates the difficulty in effectively using pedagogical tools. It is imperative for the pedagogical tools used

⁹ Scaffolding is a support process that enables PSTs to achieve a goal or perform a task that they would not be able to accomplish without help and aims to gradually move PSTs to a state of competence in which they can independently accomplish a similar task or process Smit, J., Eerde, H., & Bakker, A. (2013). A conceptualisation of whole-class scaffolding. *British Educational Research Journal*, 39(5), 817-834. .

in PETE programs to foster reflective practices both in the educator (PST) and the learner (student), ensuring both parties understand their actions and the rationale behind them.

PETE programs should emphasize an interrogative dimension when selecting pedagogical tools, aiming to foster critical reflection among PSTs (Crichton et al., 2021). Specifically, customized questions can assist PSTs to glean valuable insights from their practical experiences in becoming teachers, thereby enriching their perspectives on pedagogical thinking, interpretation, and action (Sheridan & Mungai, 2021; Tsangaridou & Polemitou, 2015). Thus, it is essential to rigorously examine the 'how,' 'what,' 'when,' and 'why' behind each strategy to ensure alignment with the unique needs and challenges faced by individual PSTs. Without such scrutiny, it seems difficult to determine how a selected pedagogical tool in a PETE program accommodates the specific difficulties and needs of each PST.

In line with the emphasis on questioning, pedagogical tools should adopt a learning paradigm that prioritizes a modern, learner-centered perspective to nurture critical thought about teaching. This paradigm advocates for a transition from traditional teacher-led instruction to a learner-centered approach¹⁰, which might enhance the reflective practices of PSTs (Hoshina et al., 2021; Rosen et al., 2020). This approach encourages PSTs to take a deep approach to their learning¹¹ (Marton, 1997), as opposed to adopting a surface approach¹², helping them consolidate their learning and derive personal insights. Thus, pedagogical tools within PETE programs ought to directly address real-world teaching challenges, promoting critical reflection among PSTs. By doing so, PSTs are better positioned to actively participate in the learning process, initiating debates, formulating critical questions, and participating in analysis and discussions.

¹⁰ Learner-centered approach “is characterized by innovative methods of teaching which aim to promote learning in communication with teachers and other learners and which take students seriously as active participants in their own learning, fostering transferable skills such as problem-solving, critical thinking and reflective thinking” Attard, A., Di Iorio, E., Geven, K., & Santa, R. (2010). *Student-Centred Learning: Toolkit for Students, Staff and Higher Education Institutions. European Students' Union (NSRF)*. .

¹¹ Learning has problems of a complex and dynamic nature that require a more comprehensive approach and thus, more precise and trustworthy Entwistle. (2000). Promoting deep learning through teaching and assessment: conceptual frameworks and educational contexts. TLRP conference, Leicester, .

¹² Learning is understood in a simplified way and is therefore limited, especially when the problems are complex *ibid.*.

Final thoughts

Based on this essay, we assert that PETE programs need to intentionally and systematically cultivate PSTs into reflective practitioners. Reflection should be recognized as a complex process that advances the generation of new insights through continuous analysis, rather than mere introspection. To be explicit, PETE programs should champion cognitive activities like critical analysis, synthesis, and evaluation. Concurrently, they should maintain a discerning and questioning approach to both existing practices and future directions, guiding PSTs toward critical reflection. The interpretation of real-world practice at various moments enhances PST's critical thinking, offering an authentic context for evaluating experiences and challenges. This encourages them to go beyond superficial solutions and consider multiple perspectives, thereby enhancing their ability to make informed pedagogical decisions. In this context, PETE programs should not isolate reflective episodes but should acknowledge the synergy and significance of each moment, understanding their cumulative impact on the development of PSTs' critical reflection skills.

Critical reflection relies on the interplay between the content, processes, objectives of the PSTs' actions, and diverse reflective moments. Consequently, PETE programs ought to foster an open-minded attitude among PSTs, as this widens the range of possible solutions and responses to practical challenges they encounter. Yet, throughout their critical reflection journey, PSTs require consistent support. In this context, pedagogical tools are recognized as structures and approaches that facilitate the growth of PSTs' critical reflection, with the scaffolding process being inherent.

Future research should prioritize the process of becoming reflective practitioners, emphasizing the constant interaction between reflective concepts and strategies during the practicum. To achieve this, PSTs should begin by evaluating their actions (reflection), ground their actions in decisions (reflective practice), and subsequently scrutinize those decisions based on personal experiences, societal and ethical values, and the surrounding context (critical reflection). Throughout this transformative journey, the role of the facilitator is paramount, providing consistent and appropriate support throughout the process.

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References

- Aartun, I., Walseth, K., Standal, Ø. F., & Kirk, D. (2022). Pedagogies of embodiment in physical education – a literature review. *Sport, Education and Society*, 27(1), 1-13. doi:10.1080/13573322.2020.1821182
- Alsuhaibani, Z. (2019). Perceptions and Practices of EFL Pre-Service Teachers about Reflective Teaching. *Arab World English Journal*, 10(4), 62-73. Retrieved from <https://search.ebscohost.com/login.aspx?direct=true&AuthType=ip,shib&db=eric&AN=EJ1271719&lang=pt-pt&site=ehost-live&scope=site>
- Attar, H., Shahabi, S. M., Reza, & Mohammadi, K. O., Mahdis. (2016). Reform by reflection: Schön's legacy to management practice in times of uncertainty. *Iranian Journal of Management Studies*, 9(3), 579-597.
- Attard, A., Di Iorio, E., Geven, K., & Santa, R. (2010). Student-Centred Learning: Toolkit for Students, Staff and Higher Education Institutions. *European Students' Union (NJ1)*.
- Azevedo, Araújo, & Mesquita. (2022). The development of reflective skills in physical education teacher education: a systematic review. *Retos: nuevas tendencias en educación física, deporte y recreación*, 46, 162-178. Retrieved from <https://dialnet.unirioja.es/servlet/articulo?codigo=8562027>
- Bolton, G. (2010). *Reflective practice: Writing and professional development*: Sage publications.
- Boud, D., Cressey, P., & Docherty, P. (2006). Setting the scene for productive reflection. In *Productive reflection at work* (pp. 17-24): Routledge.
- Buschor, C. B., & Kamm, E. (2015). Supporting student teachers' reflective attitude and research-oriented stance. *Educational Research for Policy and Practice*, 14(3), 231-245. doi:10.1007/s10671-015-9186-z
- Clarà, M. (2015). What is reflection? Looking for clarity in an ambiguous notion. *Journal of Teacher Education*, 66(3), 261-271.
- Cowan, J. (2006). *On becoming an innovative university teacher: Reflection in action: Reflection in action*: McGraw-Hill Education (UK).
- Cowan, J., & Stroud, R. (2016). Composting reflections for development. *Reflective Practice*, 17(1), 27-33. doi:<https://doi.org/10.1080/14623943.2015.1123684>
- Crichton, H., Valdera Gil, F., & Hadfield, C. (2021). Reflections on peer micro-teaching: raising questions about theory informed practice. *Reflective Practice*, 22(3), 345-362.
- Cushion, C. J. (2018). Reflection and reflective practice discourses in coaching: a critical analysis. *Sport, Education and Society*, 23(1), 82-94. doi:10.1080/13573322.2016.1142961
- Dewey, J. (1933). How We Think. *Journal of Education*, 116(12), 321-321. Retrieved from <http://search.ebscohost.com/login.aspx?direct=true&AuthType=ip,uid&db>

[=Ils&AN=22029848&lang=pt-pt&site=ehost-live&scope=site](#)

- Entwistle. (2000). *Promoting deep learning through teaching and assessment: conceptual frameworks and educational contexts*. Paper presented at the TLRP conference, Leicester.
- Entwistle, & Entwistle. (1991). Contrasting forms of understanding for degree examinations: the student experience and its implications. *Higher Education*, 22, 205-227.
- Erdemir, N., & Yeşilçınar, S. (2021). Reflective practices in micro teaching from the perspective of preservice teachers: teacher feedback, peer feedback and self-reflection. *Reflective Practice*, 22(6), 766-781.
- Farias, C., Hastie, P. A., & Mesquita, I. (2018). Scaffolding student-coaches' instructional leadership toward student-centred peer interactions: A yearlong action-research intervention in sport education. *European Physical Education Review*, 24(3), 269-291.
- Fendler, L. (2003). Teacher reflection in a hall of mirrors: Historical influences and political reverberations. *Educational Researcher*, 32(3), 16-25.
- Fletcher, T., & Kosnik, C. (2016). Pre-service primary teachers negotiating physical education identities during the practicum. *Education 3-13*, 44(5), 556-565.
- Gursansky, D., Quinn, D., & Le Sueur, E. (2010). Authenticity in reflection: Building reflective skills for social work. *Social Work Education*, 29(7), 778-791.
- Hall, L. A. (2018). Using blogs to support reflection in teacher education. *Literacy Research and Instruction*, 57(1), 26-43.
- Hoshina, Y., Shikino, K., Yamauchi, Y., Yanagita, Y., Yokokawa, D., Tsukamoto, T., . . . Ikusaka, M. (2021). Does a learner-centered approach using teleconference improve medical students' psychological safety and self-explanation in clinical reasoning conferences? a crossover study. *PloS one*, 15(7), 1-12. doi:10.1371/journal.pone.0253884
- Huntley, C. (2008). Supporting critical reflection in pre-service teacher education. *Journal of the Scholarship of Teaching and Learning for Christians in Higher Education*, 3(1), 7.
- Jay, J. K., & Johnson, K. L. (2002). Capturing complexity: A typology of reflective practice for teacher education. *Teaching and Teacher Education*, 18(1), 73-85.
- Kansanen, P. (1995). *Discussion on Some Educational Issues VI. Research Report 145*: ERIC.
- Lamb, P. (2015). Peer-learning between pre-service teachers: embracing Lesson Study. *International Journal for Lesson and Learning Studies*.
- Larrivee, B. (2008). Meeting the challenge of preparing reflective practitioners. *The New Educator*, 4(2), 87-106.
- Liu. (2015). Critical reflection as a framework for transformative learning in teacher education. *Educational Review*, 67(2), 135-157.
- Manen, M. (1991). Reflectivity and the pedagogical moment: The normativity of pedagogical thinking and acting. *J. Curriculum Studies*, 23(6), 507-536.
- Marshall, T. (2019). The concept of reflection: a systematic review and thematic synthesis across professional contexts. *Reflective Practice*, 20(3), 396-415.

- Marshall, T., Keville, S., Cain, A., & Adler, J. R. (2022). Facilitating reflection: a review and synthesis of the factors enabling effective facilitation of reflective practice. *Reflective Practice*, 23(4), 483-496. doi:10.1080/14623943.2022.2064444
- Marton, F. (1997). Approaches to learning. *The experience of learning*, 39-58.
- McEvoy, E., MacPhail, A., & Heikinaro-Johansson, P. (2015). Physical education teacher educators: A 25-year scoping review of literature. *Teaching and Teacher Education*, 51, 162-181. doi:<https://doi.org/10.1016/j.tate.2015.07.005>
- Mesquita, I., Farias, C., De Martin Silva, L., Afonso, J., & Coutinho, P. (2023). How Can Learner-Oriented Scaffolding Strategies Be Implemented in Coach Education? A Case Study. *Research Quarterly for Exercise and Sport*, 94(1), 216-225. doi:10.1080/02701367.2021.1961994
- Mezirow, J. (1990). *Fostering critical reflection in adulthood*: Jossey-Bass Publishers San Francisco.
- Miller, P. E. (2022). Reflection-in-action: the use of student audio recordings. *Social Work Education*, 1-15. doi:<https://doi.org/10.1080/02615479.2022.2031961>
- Moon. (2013). *Reflection in learning and professional development: Theory and practice*: Routledge.
- Mooney, A., & Hickey, C. (2017). '(Dis) empowered by what we see...': exploring the use of video-stimulated reflection in physical education pedagogy and practice. *Asia-Pacific Journal of Health, Sport and Physical Education*, 8(3), 229-244.
- Nagro, S. A., & deBettencourt, L. U. (2019). Reflection activities within clinical experiences: An important component of field-based teacher education. *Handbook of research on field-based teacher education*, 565-586.
- Nelson, F. L., & Sadler, T. (2013). A third space for reflection by teacher educators: A heuristic for understanding orientations to and components of reflection. *Reflective Practice*, 14(1), 43-57.
- O'Reilly, S., & Milner, J. (2020). Impact of technology-based reflective practice tools on student skill development. *International Journal of Technology and Human Interaction (IJTHI)*, 16(1), 77-93.
- Østergaard, L. D. (2019). Creation of new routines in physical education: second-order reflection as a tradition-challenging form of reflection stimulated by inquiry-based learning. *Sport, Education and Society*, 24(9), 981-993.
- Peralta, L. R., Bennie, A., Gore, J., & Lonsdale, C. (2021). An Investigation of the Influence of Video Types and External Facilitation on PE Inservice Teachers' Reflections and Their Perceptions of Learning: Findings From the AMPED Cluster Controlled Trial. *Journal of Teacher Education*, 72(3), 368-380.
- Ravanal Moreno, E., Cabello, V. M., López-Cortés, F., & Amórtegui Cedeño, E. (2021). The reflective practice as a tool for making tacit knowledge explicit. *Reflective Practice*, 22(4), 515-530. doi:10.1080/14623943.2021.1930527
- Robinson, M., & Rousseau, N. (2018). Disparate understandings of the nature, purpose and practices of reflection in teacher education. *South African Journal of Childhood Education*, 8(1), 1-9.
- Rosen, M. L., Cerullo, J., Martinez, G., Mione, K.-K., Note, A., & Vasquez, N.

- (2020). Letting go of the lesson plan: spontaneity and flexibility in a learner-centered approach to maximize learning in a graduate school setting. *Transformations: The Journal of Inclusive Scholarship and Pedagogy*, 30(2), 163-173.
- Russell, T. (2005). Can reflective practice be taught? *Reflective Practice*, 6(2), 199-204.
- Schön, D. A. (1983). *The reflective practitioner*. Nova York: Basic Books.
- Schön, D. A. (1987). *Educating the reflective practitioner*. San Francisco, CA: Jossey-Bass.
- Schön, D. A. (1995). *The reflective practitioner: How professionals think in action*. New York: Basic Books.
- Sheridan, L., & Mungai, M. (2021). Teacher-student reflections: A critical conversation about values and cultural awareness in community development work, and implications for teaching and practice. *Education Sciences*, 11(9), 1-12. doi:10.3390/educsci11090526
- Sicora, A. (2019). Reflective practice and learning from mistakes in social work student placement. *Social Work Education*, 38(1), 63-74.
- Smit, J., Eerde, H., & Bakker, A. (2013). A conceptualisation of whole-class scaffolding. *British Educational Research Journal*, 39(5), 817-834.
- Suphasri, P., & Sumalee, C. (2021). Reflective Practice in Teacher Education: Issues, Challenges, and Considerations. *PASAA: A Journal of Language Teaching and Learning in Thailand*, 62, 236-264. Retrieved from <https://search.ebscohost.com/login.aspx?direct=true&AuthType=ip,shib&db=mlf&AN=EIS155413737&lang=pt-pt&site=ehost-live&scope=site>
- Tinning, R. (2016). Transformative pedagogies and physical education: Exploring the possibilities for personal change and social change. In *Routledge handbook of physical education pedagogies* (pp. 299-312): Routledge.
- Tsangaridou, & Polemitou. (2015). Exploring pre-service classroom teachers' reflections on teaching physical education. *European Physical Education Review*, 21(1), 66-82.
- Tsangaridou, N., & O'Sullivan, M. (1994). Using pedagogical reflective strategies to enhance reflection among preservice physical education teachers. *Journal of Teaching in Physical Education*, 14(1), 13-33.
- Valli, L. (1997). Listening to other voices: A description of teacher reflection in the United States. *Peabody journal of Education*, 72(1), 67-88.
- Van Manen, M. (1977). Linking ways of knowing with ways of being practical. *Curriculum inquiry*, 6(3), 205-228.
- Van Woerkom, M. (2010). Critical reflection as a rationalistic ideal. *Adult Education Quarterly*, 60(4), 339-356.
- Vivekananda-Schmidt, P., Marshall, M., Stark, P., Mckendree, J., Sandars, J., & Smithson, S. (2011). Lessons from medical students' perceptions of learning reflective skills: a multi-institutional study. *Medical Teacher*, 33(10), 846-850.
- Zeichner, K., & Liston, D. (1987). Teaching student teachers to reflect. *Harvard Educational Review*, 57(1), 23-49.
- Zhu. (2011). Student teachers' reflection during practicum: Plenty on action, few in action. *Reflective Practice*, 12(6), 763-775.

Chapter III – Empirical Articles

Empirical Article 1

Diving into Real-World Practicum in Physical Education: Deconstructing and Re-signifying Pre-service Teachers' Reflections

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Abstract

Reflection is crucial for aspiring teachers, yet many pre-service teachers (PSTs) struggle to grasp its true meaning. This study explores how PSTs deconstruct their initial reflections and re-signify their understanding based on challenges encountered in real-world practicum settings. Additionally, it examines how the facilitator supported the PSTs' reflections over time. Over the course of a year in the physical education teacher education context, six PSTs, along with the first author fulfilling dual roles as external facilitator and researcher, engaged in three iterative Action Research (AR) cycles. Within each AR cycle, the external facilitator explored the authentic teaching challenges faced by PSTs, offering individualized support while unpacking reflection concepts. Data was collected through focus group interviews, reflective journals from the PSTs, and participant observations by the external facilitator, which provided contextual field notes on the PSTs' teaching-learning experiences. Our findings emphasize the need to initially understand PSTs' views on reflection. This serves as a starting point for deconstructing the three concepts outlined in our theoretical framework, through the scrutiny of PSTs' real teaching-learning experiences. This process facilitated a resignification, leading to an advanced comprehension of reflection among the PSTs. The study emphasizes the value of integrating this approach into systemic teacher education reforms and suggests extending training and mentorship to cooperating teachers.

Keywords: reflective practice; physical education teacher education; facilitator role

1. Introduction

Nowadays, reflection is considered a crucial skill for pre-service teachers (PSTs) who need to be 'thoughtful and alert' during their educational journey to become effective practitioners (De Beer, 2023; Liesa et al., 2023; Osmanović-Zajić & Maksimović, 2020). Accordingly, most teacher preparation programs advocate for reflective practice to help PSTs navigate the challenges of the

teaching-learning process and improve their efficacy and proficiency (Hordvik et al., 2019). Despite these encouragements, many PSTs continue to struggle with both practising and understanding reflection. This struggle is heightened in Physical Education Teacher Education (PETE), where subject intricacies and a myriad of complex, non-linear, and diverse challenges further complicate reflection (Minott, 2019; Mulryan-Kyne, 2021).

Overall, integrating reflection into teaching practice empowers PSTs to navigate teaching challenges, interpret practical experiences, and identify areas for growth in uncertain circumstances (Attar et al., 2016). Indeed, active participation in the process of reflection nurtures the cultivation of reflective practice, characterized by heightened self-awareness (Acquah & Commins, 2015). Through reflective practice, PSTs can become empowered, enhancing professional growth and profound transformation (Schön, 1987). Nevertheless, the reflective practice process presents challenges and complexities that hinder inexperienced teachers from fully engaging in this transformative process. Consequently, when asked to reflect on their teaching-learning experiences, PSTs tend to provide summaries with descriptive rather than analytical insights (Azevedo et al., 2022; Azevedo et al., 2023). This challenge primarily arises from their tendency to prioritize content knowledge in teaching-learning practice (Capel, 2007), resulting in a surface-level understanding of reflection as a routine task in their profession, lacking in-depth interpretation (Standal & Moe, 2013). Another fundamental issue that has been consistently highlighted in the literature involves the challenges that PSTs often face due to their limited scope in reflective practice. These challenges often arise from PSTs' unclear understanding of how to engage meaningfully in reflection (Moore-Russo & Wilsey, 2014). Such limitations not only restrict the type of reflective practice but also often fail to consider critical factors within the teaching-learning experiential context (Samuels & Betts, 2007). This, in turn, limits the overall reflective growth of PSTs.

Therefore, it is of utmost importance for PSTs to grasp the nuances of their reflective practice, including the ability to differentiate between superficial and deep reflection (Azimi et al., 2019) and to understand how to immerse themselves

in a practice that embodies critical reflection. To achieve this, the PSTs must be capable of deconstructing their preconceived ideas about reflection, enabling them to take the first step towards a critical evaluation of their initial understandings. Indeed, PSTs need to develop the ability to actively participate in critical reflection and interpret their own experiences (Moore-Russo & Wilsey, 2014). However, PSTs are often unaware of their reflection level and the specific topics they are considering. This requires a constructivist approach (where learners construct their own knowledge connected to their prior experience and knowledge embedded in meaningful contexts) (Mesquita et al., 2014) that includes both the content and process of reflection. In terms of content (e.g., examining the PSTs' reflections on their teaching practice, such as planning, classroom interactions, and faced challenges), it provides insights into how these experiences shape their reflective practice. Regarding the process (e.g., understanding the nature of reflection, identifying its practical contexts, clarifying goals, and defining how to nurture it) it involves a deeper exploration of the reflective practice itself. A vital component of this constructivist approach is the resignification phase, wherein PSTs reconstruct their conceptions of reflection. This phase involves adopting a more profound and analytical viewpoint, extending beyond the simple act of reflection. It encompasses their engagement in interpreting and critically applying their reflective insights within the teaching and learning contexts. In doing so, PSTs will be better prepared to navigate the challenges inherent in their experiences effectively and progress towards becoming adept critical thinkers (Liu, 2015). While a substantial body of empirical research in PETE has explored various strategies and learning environments to foster reflection and critical reflection (Greve et al., 2021; Peralta et al., 2021), there remains a noticeable gap in the literature regarding how PSTs effectively internalize the concepts and processes of reflection, as well as the difficulties they encounter in recognizing the personal effort that reflection demands.

One critical factor influencing the internalization of the reflective process among individuals is learning that it is contextualized, situated within relevant contexts, and directly tied to their teaching-learning experiences, fostering a sense of inclusion (Moon, 2004). Indeed, research has highlighted that the value

of PSTs' reflections may be tied to the sociocultural context in which they learn and in which reflection is enacted (Chye et al., 2021; Vesterinen et al., 2014). The practicum provides an immersive opportunity to enhance PSTs' critical reflection by interpreting their challenges and extensively comprehending their teaching-learning experiences (Schön, 1987). Thus, integrating teaching-learning experiences gained during practicum with reflective practices can serve as a valuable strategy for guiding PSTs in addressing the specific challenges they are likely to face throughout their careers as educators (Larrivee, 2008). This immersive endeavor enables PSTs to self-regulate their learning effectively (Gomes et al., 2018) and cultivate a multi-perspective thinking ability (Miller, 2022). Moreover, it empowers them to critically scrutinize the widely accepted practices in physical education (PE) (Greve et al., 2021), which, in turn, facilitates the development of PSTs' critical reflection (Schön, 1987).

While empirical evidence underscores the advantages of reflective practice during the practicum (L. Y. Y. Foong et al., 2018; Ruffinelli et al., 2022; Zhu, 2011), much of the prior research has been concentrated on the theoretical-practical nexus within this context (Nelson et al., 2016; Prado et al., 2019) or on PSTs' perceptions about the content of reflection (Østerlie & Kristensen, 2023). This highlights a pressing need to investigate how these theoretical foundations are seamlessly integrated into PSTs' daily experiences, facilitating their ability to address challenges and refine their teaching-learning process.

Moreover, despite this recognition, particularly in PETE, many PSTs struggle to reflect during practicum due to the perception of having 'too many things going on' (Zhu, 2011). This challenge underscores the need for more contextualized and experientially relevant approaches to help PSTs internalize the reflective process and tackle the concrete challenges they will face in their professional journeys. Among the key factors facilitating the development of meaningful and productive reflection of PSTs is the necessity for continuous instruction, guidance, and deliberate practice involving both supervisors and peers (T. Marshall et al., 2022). However, existing research on PETE has notably fallen short in exploring this crucial type of support.

For instance, Vogelsang et al. (2022) point out that in practicum, reflection is not sufficiently supported for PSTs. Creating a supportive environment, providing ongoing instruction, and facilitating collaborative reflection are crucial for PSTs to meaningfully engage in the reflective process (Jones & Ryan, 2014). Through meaningful dialogue and active listening, facilitators (i.e., supervisors) empower PSTs to navigate the complexities of their practice (Farias et al., 2018), and fostering critical decision-making (T. Marshall et al., 2022). Therefore, facilitators can guide PSTs to deconstruct reflection (Gonçalves et al., 2022) and explore experiences from diverse perspectives (Verwoerd et al., 2020). Furthermore, there is a lack of interventional research exploration that enables, stimulates, and explores the intentional influence of a facilitator on scaffolding the development of PSTs' reflection process through the interpretation of their practical problems.

An Action Research (AR) design can address this need by fostering ongoing improvement through iterative processes and personalized support (e.g., guidance from a supervisor or facilitator), empowering PSTs to enhance their understanding and application of reflective practices within the practicum (McKernan, 1996). Accordingly, adopting an AR design, the aim of this study was to explore how PSTs deconstruct their initial reflections and subsequently re-signify their understanding, based on challenges encountered in real-world practicum settings. Additionally, it examines how the facilitator supported the PSTs' reflections over time.

2. Theoretical framework – Reflection Concepts

2.1. Reflection, reflective practice, and critical reflection

In this study, understanding the dimensions of reflection - reflection, reflective practice, and critical reflection – as non-hierarchical stages but as interconnected concepts that emerged from analyzing the practical difficulties of PSTs is crucial to offer distinct yet interrelated conceptualizations, contributing to a comprehensive interpretation.

Hence, the term 'reflection' in this study is used in two interrelated contexts. Firstly, it is a cognitive process used to navigate complex problems (Dewey,

1933b), involving synthesizing ideas, questioning narratives, and integrating knowledge to better understand personal subjectivity and experiences (Marshall, 2019). This iterative process requires a sustained re-examination of ideas and an active and conscious intention to comprehend experiences and generate fresh insights (Moon, 2013). Secondly, 'reflection' also denotes the initial stage in the continuum of developing reflective abilities, where PSTs begin to engage with the concept at a fundamental level. In parallel, reflective practice encompasses the practical application of the reflective process in daily decision-making and problem-solving (Clarà, 2015). It builds upon the foundational stage of reflection, extending it into the realm of practical teaching scenarios. Critical reflection represents a further deepening and broadening of this process. It is a complex transition influenced by multiple factors, such as diverse perspectives, varying historical backgrounds, and socio-political contexts (Hatton & Smith, 1995). Besides, it involves a comprehensive understanding that extends beyond the individual's personal experiences to include broader societal and institutional dynamics. This level of reflection includes reflecting on established assumptions about teaching, learning, self, school, and society, as well as education's societal and political impacts, entailing ongoing analysis, questioning, and critique of these assumptions, leading to transformative changes in practice (Liu, 2015).

The process of deconstruction-resignification, integral to this framework, illustrates how PSTs revise and redefine their understanding of these reflection dimensions. Deconstruction refers to critically examining and questioning existing practices and understandings, particularly in response to challenges encountered in their practicum. This process aligns with the constructivist principles of learning through experience and reflection. As PSTs deconstruct, they are actively engaging with their experiences, reflecting upon and questioning their prior understandings and practices.

Resignification occurs as PSTs integrate new insights gained from this critical examination. This leads to a redefined and enriched approach to reflection that is more directly aligned with their practical experiences. In a constructivist approach, this process is fundamental as it allows learners to reconstruct their knowledge and understanding based on their experiences, fostering deeper and

more meaningful learning. Thus, the journey of deconstruction and resignification not only enhances their conceptual understanding but also brings theory and practice into a closer, more harmonious relationship.

3. Methodology

3.1. Study design

A qualitative approach was employed in this study to investigate not only the PSTs' understanding of reflection but also how the facilitator supported their reflections during the practicum. This approach is suitable for exploring practical themes and understanding the 'who, what, and where' of events or experiences (Sandelowski, 2000, p. 338). Situated within the interpretative paradigm, the study acknowledges reality's diverse and subjective nature and knowledge's socially constructed nature, embracing ontological relativism and epistemological constructionism (Weed, 2009).

This study followed an AR design (Lewin, 1946), with an interventionist approach (Cooke & Cox, 2005) across three cycles conducted during a school year (from September 2016 to June 2017). Each AR-cycle corresponded to a distinct school year period. The first author, acting as the External Facilitator (EF), had a multifaceted role focused on enhancing PSTs' identification of areas for improvement, promoting inclusive participation, and empowering those PSTs who lacked confidence. Through processes of thinking, planning, acting, evaluating, and rethinking, the EF aimed to understand PSTs' practice issues and provide individualized support, incorporating deconstruction of reflection concepts. This process stemmed from the genuine challenges faced by PSTs in their teaching practicum. To facilitate this process, the first AR-cycle included a diagnostic phase. This phase was introduced to allow the EF to become familiar with the PSTs' understanding of reflection, thereby guiding subsequent interventions to address the real needs and challenges they faced during their practicum (Gilbourne, 1999b). This phase also helped the EF choose pertinent content for subsequent AR-cycles and scaffold PSTs' deconstruction of theoretical concepts.

In line with the fundamental tenet of AR, which emphasizes collaboration and improvement of actions (Kemmis, 2010), PSTs were active participants in the research process, not merely as objects of study but as co-constructors of their own learning (Casey et al., 2017). This involvement primarily included examining and interpreting their own experiences during their practicum.

3.2. Context and participants

The research took place in a two-year PETE Program and focused on six PSTs in the second year of their master's program (i.e., practicum). This particular PETE program included a reflection component during the practicum, specifically by requiring PSTs to keep reflective journals. These PSTs were supervised by a cooperating teacher from the host school and a supervisor from the university. The practicum was conducted in various schools, with this particular group of PSTs being assigned to three different schools. Participants were selected based on availability, willingness to participate and school placements (Sarstedt et al., 2018). The EF, holding a master's degree in PE and being a PhD student in Sports Science, was well-suited for the study's interventionist approach, given a deep academic engagement with the subject. All participants were informed of the scope of the research and their right to withdraw from the study. Consent forms were signed by all participants, and anonymity was established by using pseudonyms. The host university's ethical commission approved all the procedures.

3.3. Data collection

The data collection sequence started with focus group interviews (FG), followed by participant observations (PO), and concluded with Reflective Journals (RJ). This specific order was designed for a holistic understanding of PSTs' reflection. The initial focus groups helped identify key themes and questions that were further explored during participant observations. Finally, Reflective Journals allowed PSTs to self-reflect on their experiences, thereby enriching and triangulating the data gathered from the earlier methods. The continuous flow of the AR process, alongside its inherent phases, was complemented by the interplay between these three data collection methods.

3.4. Focus Group

The reflective semi-structured FG discussions were conducted by the EF (*Morgan, 1997; Patton, 2015*), for two purposes: first, to explore PSTs' understanding and thoughts on their practicum experiences, aimed at fostering their reflective capacity and teaching improvement; second, to facilitate discussions on key concepts related to the process of reflection such as reflective practice and critical reflection. The EF cultivated a social environment of trust (*Kreijns et al., 2013*), promoting dialogue and critical thinking essential for reflective growth. The EF prompted PSTs into reflection by discussing and interpreting their teaching challenges. These three FGs were evenly distributed throughout the academic year, capturing early, mid, and late stages, held in faculty settings, audio-recorded, lasting approximately 110 minutes each, and transcribed verbatim.

3.5. Participant observation

The EF conducted PO intending to explore the 'how' and 'why' behind the PSTs' practical experiences (*Emerson et al., 2001*). This entailed observing the PSTs' spontaneous actions within their teaching environment, allowing the EF to interpret the PSTs' teaching practices and generate a more comprehensive understanding of the practicum experience. Through these observations, the EF gained insight into the consistency between the PSTs' actions and their previously expressed ideas and how well they applied the reflective content discussed in the previous FG. This information guided the formulation of questions for the next FG session, which aimed to help the PSTs relate to their experiences and deconstruct the theoretical concepts they had learned (*Öhman & Quennerstedt, 2012*).

3.6. Reflective Journal

The RJs were assembled by the PSTs as part of their activities, but also were intentionally structured and scaffolded by the EF to deepen their understanding of reflective concepts. Through writing, the PSTs could explore and critically analyze the challenges encountered in practice, leading to a more profound comprehension of reflection (*De Martin-Silva et al., 2015*). Writing in the

journals facilitated the systematization of their ideas about their practical experiences and the reflective concepts discussed in the previous FG session. Furthermore, following each PO, the EF suggested additional avenues for exploration, focusing on specific problems observed that required further clarification. This contributed to a deeper understanding of the PSTs' teaching experiences and connected their practical observations with the reflective concepts discussed in the FGs.

3.7. Data analysis and research procedures

In AR, analysis takes place in an ongoing analysis conducted throughout the three cycles and an overall analysis of the research (Casey *et al.*, 2017), to reflect the on-the-spot, interactive and cyclical epistemological nature of AR (Braun & Clarke, 2019). The research followed a deductive process, using theory to identify what the PSTs knew about reflection, which in turn guided the formulation of research aims, interview questions, and further theoretical content.

Collaboration played a central role in this research, involving six PSTs engaged in practicum and the EF. Through collaboration, the aim was to deepen and expedite the understanding of the ongoing action, leveraging the diverse experiences of the PSTs to foster personal and professional growth (Greenwood & Levin, 2003). This objective was achieved by facilitating group discussions, providing theoretical frameworks for debate (grounded in discussions, participant observations, and PSTs' written reflections), and scaffolding PSTs in articulating their perspectives and experiences.

The EF played a crucial role in the process of deconstructing complex reflection concepts, breaking them down into more understandable parts. This was achieved by providing a framework and guidance to clarify and challenge the PSTs' preconceptions, leading to a deeper understanding of reflection. In contrast, the PSTs deconstructed their teaching-learning practices and initial reflections. This self-reflective process involved critically examining and re-evaluating their experiences and practices in light of the theoretical knowledge provided, fostering a more nuanced and comprehensive understanding of reflection.

In this context, the focus of deconstruction and resignification varied. The EF's deconstruction was geared towards clarifying reflection concepts, while the PSTs focused on critically analyzing their teaching methods and experiences. The process of resignification occurred as the PSTs integrated this new understanding into their teaching practice, leading to a refined and enhanced approach to teaching and learning. This approach not only aligned with the analysis and exploration of specific issues during the PSTs' practicum (*Holter & Schwartz-Barcott, 1993*) but also completed a cyclical journey of understanding and applying reflection concepts in practice (see Figure 1).

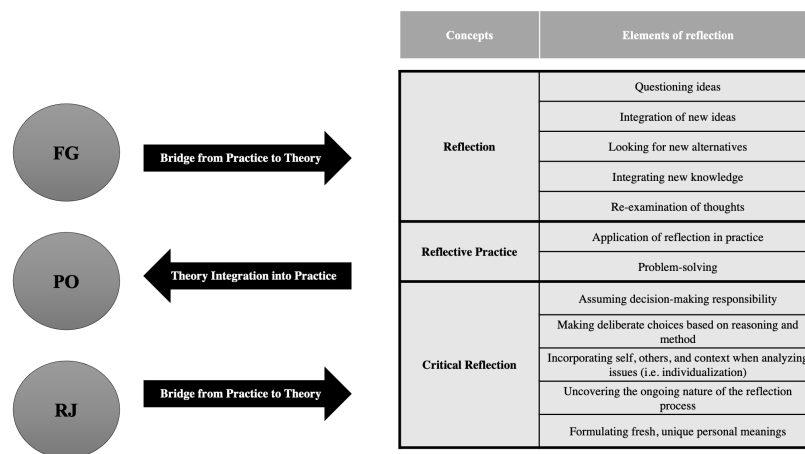


Figure A1. Interplay of Reflection Concepts and Data Collection Methods.

The data underwent a thematic analysis (*Braun & Clarke, 2021*) process to analyse and interpret the information. In the initial stage, the first author immersed in the transcribed data, reading it multiple times to become familiar with its contents. Relevant segments of data were identified and labelled with initial codes. This coding process was systematic and rigorous, aiming to establish 'a solid foundation' for developing themes (*Braun & Clarke, 2019, p. 9*). The first author engaged in discussions with the last author to refine the codes and identify themes. Through collaborative dialogue, the last author offered insights that unveiled new subtleties in the data, prompting the first author to revisit and refine the coding and themes meticulously. The themes were then moved from a surface level, based on the explicit content shared by the PSTs, to a deeper level,

focusing on the underlying ideas conveyed by the PSTs (*Braun & Clarke, 2016*). The next phase involved generating initial themes relevant to the research question, addressing concepts and organizing the codes into coherent themes. The data was reviewed repeatedly in the fourth phase to ensure the analysis accurately represented the data and aligned with the research question. The fifth phase involved a thorough review of the data by the first author to prevent misrepresentation through coding and content structuring. The analysis was repeatedly checked to ensure alignment with the research framework and maintain data integrity. Finally, in the sixth phase, the identified themes were (re)named to reflect the temporal impact of the AR's constructivist epistemology. The process involved writing the report, fully analyzing developed themes, and presenting a concise, coherent, and logically structured data account. These main themes are presented in the 'Results' section, providing insights and findings from the analysis.

3.8. Trustworthiness

Several criteria were implemented to ensure trustworthiness in the study (*L. S. Nowell et al., 2017*). Firstly, participants in the FG were encouraged to express their honest opinions and perspectives without being influenced by others, valuing each individual's thoughts equally (*Coghlan, 2019*). Secondly, data triangulation was employed by utilizing multiple data collection sources, such as FG, PO, peer observations, and RJ, to gain different perspectives on the phenomena under investigation (*Denzin, 2012*). Thirdly, regular peer briefings and data analysis within the research team were conducted to mitigate the influence of subjective perspectives and promote rigorous scrutiny of the data. Lastly, the PSTs were frequently probed about the underlying meanings of their actions and verbal expressions, while also acknowledging disciplined subjectivity through recognition of the researcher's own subjectivity (*Efron & Ravid, 2019*). These procedures aimed to regulate the subjective aspects inherent in qualitative research and enhance the overall trustworthiness of the findings (*Patton, 2015*).

4. Results

4.1.

1st AR-cycle - Reflection understood as a container of ideas or a checking system - 'I understand reflection as the organization of the elements included in the lesson plan and the realization of what I did or didn't do after the lesson.'

In the first FG, the facilitator tried to understand how the PSTs understood reflection and its application to teaching-learning practice. The EF aimed to identify the PSTs' baseline to develop further nuanced reflective abilities: 'Facilitator - do you reflect on your practice? What does reflecting mean to you? How does reflecting help you when you are teaching? Give me an example.' The PSTs clarified that the fact it was a required task during the practicum was naturally done: '*Maria* - yes, it's one of the many things that are imposed on us throughout the year, so we reflect.' However, the PSTs understood reflection as merely recounting their actions in the teaching-learning process. They simply provided a narrative of what had transpired in their most recent class without engaging in any critical thinking: '*Antônio* - I analyze the material I'm going to cover, for example, and how I'm going to plan it and then how I managed to execute it in class.'

The awareness of applying reflection in practice for the PSTs was related to the act of describing and reporting all the elements integrated into the lesson plan: '*Carlos* - I go to class, try to review the entire plan in my head to see if I remember everything I had planned, try to see how many students I'll have, the materials... those things, and of course it always makes me very anxious.'

Also, during the PO, the facilitator noted that the PSTs engaged in limited analysis, ignoring other factors that could contribute to the lesson's success: 'Facilitator - aren't there other important things you should be aware of? *Maria* - the important things are the ones that are here (lesson plan).' On the other hand, the facilitator understood the limitations of the PSTs in their inability to establish relationships between what was planned and what should be done: 'Facilitator - *Maria* realized that the class did not understand the exercise and still did not intervene.' In parallel, PSTs struggled to apply reflection in practice, they observed their teaching but failed to interpret it effectively: 'Facilitator - Paulo observed that the students were playing around and did not realize the need to change the class dynamic.'

In written reflection, PSTs focused on the execution of pre-established tasks. They exhibited a thought based on reporting, describing, and verifying events that occurred during teaching-learning practice: '*Antônio* - it was raining, so the lesson had to be taught on the stairs (...) all students integrated into the groups and showed attention during the instruction phase.'

Furthermore, the PSTs presented a rumination of ideas, that is, the ideas were repeated and adhered to the possibilities integrated into the lesson plan, not analyzing the reasons that justified changing the planned exercises: '*Gustavo* - I thought it was important to change this exercise organization (...) I modified the learning situation according to the alternatives I had included in the plan (...)'. Similarly, when PSTs demonstrated the ability to integrate new elements into their analysis, such as student behavior, they limited themselves to constantly applying the same strategy. PSTs could not reflect on their actions, in the sense of trying to understand them: '*Paulo* - this behavior of the students cannot happen again' (...) whenever this behavior arose, I reprimanded them.'

4.2.

2nd AR-cycle – Reflection understood as a means to discover one's own doubts and interpret practice – 'I reflect to open my mind beyond the obvious.'

In the previous cycle, the PSTs were not aware of how limited their reflection was and tended to associate it with the idea of 'depositing ideas'. So, to help the PSTs understand their limitations regarding what reflection truly means, as well as how limited their understanding of reflection was and how it could be applied (i.e., reflective practice), the facilitator introduced and explained the concepts of reflection and reflective practice. Here, the facilitator intended to deconstruct the idea of what reflection is, regardless of the levels of reflection, so that they could understand what reflection and practical reflection are. The EF used concrete examples from practice to engage the PSTs and help them identify with the process: 'Facilitator – (...) reflection involves understanding the reasons for our actions, questioning the decision, evaluating its impact, and trying to understand what we can do to improve as professionals (...) Reflective practice is related to the interpretation of your own practice.'

The deconstruction of reflection and reflective practice by the facilitator, through specific examples from the PSTs' practice, led to the PSTs becoming aware that their way of thinking did not include reflection: '*Maria* – wait, so we weren't reflecting, but just stating?' and that if they were actually to reflect, they could be more effective in their teaching: '*Gustavo* – if I think, or rather reflect, in that way, it could help me improve my lessons.'

Based on their renewed understanding of both concepts, the PSTs were able to raise questions, specifically about the relevance of integrating new ideas into their reflections: '*Gustavo* – wouldn't it be productive to think about other things? Or because we are PSTs, do we always need to think in a PSTs way?' as well as the need to get more involved and take responsibility for decision-making: '*Maria* – wouldn't it also be important, for example, to have a stronger attitude, to impose ourselves more when we disagree with you CT or I don't know, to step forward and act?'. Throughout the dialogue, PSTs also started to look for new alternatives: '*Paulo* – then it would be important to consider other options instead of always applying the same solution.'

However, during the facilitator's explanations, the PSTs showed they did not understand the differences between reflection and reflective practice: '*Gustavo* – OK, but now I don't know if I get it, are they the same [reflection and reflective practice]? They seem synonymous.' For this reason, the facilitator provided a clarification about the concepts of reflection: 'Facilitator – well then, reflection is more related to a more introspective, more intimate action, applying a set of skills such as questioning, analyzing, evaluating, confronting to make a decision (...) is more closely related to a process of questioning your actions and thoughts. Through this questioning process, you will begin to incorporate and examine new ideas.'

Then, the facilitator deconstructed the meaning of reflective practice, referring to situations that had occurred in the teaching-learning practice of the PST in question, to make more explicit understandings of the concepts: '*Facilitator* – in your activity as a PST (...) you will interpret why that solution applied in your classes did not work and look for new solutions (...) 'listing some reasons for the need for its implementation: 'because this way you have more

abilities not to be surprised or swallowed up by problems, you are dependent on yourselves and not on others' opinions or what you have seen done (...)'.

This explanation leads PSTs to recognize the need for actively solving their problems (i.e., problem-solving) during teaching instead of ignoring what is happening: 'Carlos – I see, so we must think about what we can do differently in our classroom. It's not just about following the lesson plan, but also about being alert to the students' responses and adapting our methods accordingly.'

At this stage, PSTs already demonstrated the ability to analyze and change their actions, but they had difficulty positioning themselves at the center of the reflective process. The facilitator introduced and clarified the concept of critical reflection to help PSTs understand that they were a fundamental piece of the puzzle in terms of including themselves in the reflection process. For this purpose, the facilitator helped them understand that doubt was one of the key elements in developing critical reflection: '*Facilitator* – implies that you take a central position, you are the owners of your decisions (...) In other words, it is more associated with your analysis, where you assume, for example, that negative states can distort your analysis of ideas. By being aware of it, you prepare not to be carried away by the heat of the moment.'

They acknowledged that although some of these questions may have arisen before, they were reluctant to express them because they did not usually include them in their analyses of lessons. *António* said: 'This was something we hadn't even thought of, and even if we had, I was afraid to look ignorant by asking about it because these questions are not part of our lesson analyses.' This allowed them to begin to understand and recognize the importance of including elements of critical reflection, such as multiple perspectives, in their analyses. *António* continued: 'Only now have I realized I should explore other options, relativize, and not just focus on the problem or that particular lesson.'

During the dialogue, the facilitator aimed to support PSTs in developing decision-making skills and the ability to make deliberate choices. She drew on a situation from the PSTs' teaching-learning practice to develop a characteristic element of critical reflection (i.e., focusing the reflection on themselves): 'So, *Carlos*, what do you think about how you present yourself when you teach? Have

you ever considered how this might influence your students? For example, in the dance class, how did the way you interacted with them, your disposition, and your tone of voice affect your class and their response?' By shifting the focus of their reflection to themselves, the PSTs realized they could generate new interpretations of the same situation. *Carlos* commented: 'Oh, wait, if I start looking at what I am like, me, *Carlos*, in the class? Then I already have other perspectives, I really do... Now I have to think about how I will talk to them.'

By assuming decision-making and making deliberate choices, the PSTs developed new understandings, specifically regarding how their lack of enthusiasm could affect the students and limit their involvement in the lessons. *Carlos* added: 'Now that I think about it, I may have ignored my own lack of motivation when teaching these dance classes, and that could have affected the students' motivation.'

Similarly, in the RJ, the PSTs demonstrated the ability to analyze possible reasons for what happened to have more options for the future. *Maria* stated: 'The students were constantly stopping their activities, and I have to think about why this happened.' She also reflected on what they should do to change, incorporating their own analysis in a self-critical process: 'I know that in the next class since they don't like the subjects that day, I'll have to think of a class that they'll enjoy more, that's more fun and gives them more time for activities, with fewer moments of instruction. Basically, make the class more appealing because then I know they will participate and engage much more.'

After the PO, the facilitator noted a need for the PSTs to analyze some elements related to critical reflection (i.e., their own actions and the students) and adapt their actions accordingly. *Gustavo* asked *Sara*, 'In class, were you thinking about the consequences of your yelling? You were a bit robotic; you didn't think that the little group was only responding that way because you confronted them head-on. It was a matter of 'wanting to win your way to the end,' you forgot to ask those little questions...' Specifically, the PSTs expressed difficulty in applying critical reflection during teaching and became aware of what they couldn't do when faced with a problem. *Sara* admitted: 'Yes, it was stronger than me; when

they provoke me, I think of nothing else, I just want to complete the task... so yes, you're right.'

4.3.

3rd AR-Cycle – Reflection Understood as a Process that Generates Self-Knowledge: 'When I reflect, I delve into the reasons for my actions, seeking to understand them.'

Although the PSTs had revealed an understanding of critical reflection as a process of making choices from doubts that involved taking responsibility for their actions, in the third cycle the facilitator identified a need for further development in this area, specifically concerning self-knowledge. To address this, the facilitator deconstructed the remaining elements of critical reflection through various strategies.

Initially, the facilitator encouraged the PSTs to interpret the problems faced by their colleagues, aiming to develop their ability to act in the face of a problem (i.e., incorporating others when analyzing issues): 'Facilitator – I suggest that you analyze each other's practice, as some have already been doing it in class.' Thus, the PSTs demonstrated that when facing their colleagues' problems, they became aware of the importance of adopting various strategies to guide their practice: '*Gustavo* – Look, I thought about this after that class... if she [colleague] had considered different scenarios she might have been more prepared; she often seems to act on the spot without anticipating, but anticipation is something we're all learning to do, that's what we're taught (...).'

As the discussion progressed, the facilitator deconstructed another element of critical reflection, namely the ability to relate events and intentionally attribute meaning to their actions, using a specific moment (i.e., incorporating self when analyzing issues) : 'Facilitator – Your students had already questioned you about your solution, in dividing the groups yourself, was there any reason to impose your decision? Did it have to do with any aspect of the class? And why did you do it?' The PSTs showed the discovery of new solutions and the establishment of relationships between them: '*Antônio* – The question is really knowing how to defend it and now I know (...)' They also developed their own

meanings by integrating the 'how' and 'why' behind their actions: 'I can explain why I cared more about those students and not others (...)'

To deepen the development of meanings, the facilitator asked the PSTs for an explanation related to the new elements (i.e., their own actions and the students) that they had mentioned in the previous RJs: 'Facilitator - And in what sense can these new elements help you in your practice?' The PSTs demonstrated that they had learned to commit and be accountable to themselves for the problems and their attitudes (i.e., they attributed meanings to their actions), which allowed them to increase control and security in the process: '*Gustavo* – Look, I don't blame everyone and everything now, I know that above all, I am the one steering the ship, so I assume my decisions (...)'.

Similarly, in the RJs conducted in this AR cycle, the PSTs expressed the change in their thinking to an idea that was now more complete and interacting with various elements. Not only with themselves and the students but also with the context in which they were inserted (i.e., incorporating self, others and context when analyzing issues): '*Sara* – (...) I realized, however, that my thinking is very dependent on the students; everything was around them, and now I see a broader picture (...) there are them, but there's also me and the circumstances.'

Concurrently, the PSTs recognized the 'relative world' in which they found themselves (i.e., practicum) as a place where nothing could be taken for granted and unquestionable. It is, in fact, an ongoing and unlinear process, and therefore, the importance of adapting to the context is emphasized: '(...) *Gustavo* – The issue here is being able to give different answers even to the same problems (...) of the complex and dynamic nature of the reflective process '(...) because if we just change a comma in the situation and that solution may no longer be good.' The PSTs realized that there were no unique solutions in the reflective process, but that constant learning was required: '*Maria* – This is very difficult. I found myself trying a thousand and one approaches, but they didn't work. It's not enough to know the formula and apply it, there are no unique solutions, it's constant work (...) and the depth that finding an appropriate solution could sometimes require: '(...) I now know that this needs work and dedication, it's not just about knowing the theory, that's the starting point.'

Thereafter, the facilitator turned to an event observed in the PSTs' teaching-learning practice to develop their exploration of unique personal meanings, exploring the notion of individualization and adaptation of actions according to the specificities of each student: 'Facilitator – So why did you choose to constantly change the way you spoke with them? For example, in one of the groups, did you give much less autonomy than in the last class?'. In response, the PSTs expressed an understanding of the importance of continually reflecting on their practice, as this was the only way they could realize what needed to be changed: 'Sara – This is a long process that needs to be done all the time, so now I focus on adapting my interaction to each student and not generalizing.' They also conveyed a sense of certainty that their concerns would be ongoing, rather than transient or limited to the practicum period, reflecting a broader intention for professional growth (i.e., awareness of the value of self-analysis in professional development): 'Gustavo – I currently find that my concerns will never disappear but will be different from these (...) only with this attitude can I become a good teacher.'

During the PO, the PSTs revealed an awareness of the importance of reflection, the ability to identify their mistakes and find solutions: 'António – I think I didn't explain that well. I should have adapted the exercise for this group that wasn't getting it.' In addition, the PSTs demonstrated an integration of new perspectives, specifically those of the students, valuing what the students thought, and thus were genuinely receptive to their suggestions: 'Facilitator – At the end of the class, Gustavo asked the students how they would evaluate him, requesting suggestions for improvement.'

Despite making progress in understanding the concepts of reflection, reflective practice, and critical reflection, the EF realized that some PSTs still faced difficulties in incorporating their 'selves' when analyzing issues: 'Facilitator – Maria still struggles to understand how she should distance herself from the students and how this interaction is contingent on her self-analysis.'

5. Discussion

This qualitative, year-long AR study, conducted in the context of PETE, aimed to explore how PSTs deconstruct their initial reflections (i.e., their initial

reflections about reflection concepts) and subsequently re-signify their understanding based on challenges encountered in real-world practicum settings. Moreover, it also examined how the facilitator supported the PSTs' reflections over time. Our study addresses a gap highlighted in Standal and Moe's systematic review, which asserts that PSTs in PE often lack the necessary knowledge for critical reflection. Indeed, the main value of our work lies in the ability to employ the EF's clarification and deconstruction of reflection concepts in a fully situated and contextually tailored manner, addressing each PST's distinctive experiences during their practicum. The EF skillfully guided this deconstruction by posing critical questions and challenging assumptions, prompting the PSTs to actively engage in re-examining and questioning their own practices.

This approach enabled the PSTs to recognize not only the limitations in their initial analysis of teaching-learning practices but also to deepen their understanding of essential concepts of reflection. As a result, the PSTs were not mere recipients of knowledge, they actively participated in the deconstruction process, bringing their unique insights and experiences to the fore. Such renewed awareness led them to resignify their understanding of reflection, enriched by the interpretation of challenges that emerged in their teaching-learning practice. Through this collaborative and interactive process, the PSTs gained renewed awareness, leading them to resignify their understanding of reflection. This understanding was further enriched by their interpretation of challenges that emerged in their teaching-learning practice.

Indeed, in our study, theoretical concepts proved to be essential for PSTs to understand the meaning of reflection. However, it was the interpretation of real-life challenges faced by the PSTs during their practicum that acted as a catalyst for internalizing and redefining their understandings of reflection. When PSTs had the opportunity to analyze these theoretical concepts in light of their own experiences and realities, they not only appropriated these concepts but were also able to create new understandings. This explicit process facilitated the optimized development of their growth as reflective educators, demonstrating the power of practice in enriching and shaping theory through the creation of tangible

meaning. Our approach was guided by a theoretical framework that facilitated ongoing data analysis, establishing a strong link between various reflection concepts and the specific challenges that PSTs encountered at different stages of their practicum.

During the first cycle of AR, the facilitator sought to gauge the PSTs' initial understanding of reflection and its application in their teaching-learning practice. The identification of the PSTs' initial understandings of the meaning of reflection was pivotal, as it provided a solid foundation that enabled the facilitator to select and adapt specific strategies for deconstructing and deepening their conceptual understanding and practical application of reflection (Schön, 1987). Our findings reveal that PSTs understood reflection as a process of 'checking aspects,' such as remembering plans, counting students, and considering materials '(...) try to see how many students I'll have, the materials (...)'. This limited comprehension hinders their ability to become reflective practitioners who learn continuously from their experiences and reconstruct their understanding through reflection (Larrivee, 2008).

Our findings reinforce the perspective emphasized in the literature that PSTs often focus on the superficial aspects of PE lessons (Greve et al., 2021), neglecting the deeper structure due to the demands of critical thinking and problem-solving processes (Standal & Moe, 2013). The struggle among PSTs to fully understand reflection, along with their focus on instructional aspects in PE, underscores the urgent need for a more comprehensive explanation and deconstruction of what reflection truly involves.

Based on the understanding of the PSTs' limitations regarding what reflection meant to them, the facilitator aimed to help them become aware that their current way of reflecting was constricting. To address this, in the second AR cycle, the facilitator identified a crucial need to explicitly deconstruct and clarify, firstly, the concepts of reflection and reflective practice, and later, critical reflection. Through the deconstruction of the concepts in light of the unique challenges faced by the PSTs, they were able to recognize that they were not aware of what it meant to reflect – 'wait, so we weren't reflecting, but just stating.'

They also realized that understanding its meaning would help them teach effectively – '(...) in that way, it could help me improve my lessons.'

The EF's support helped the PSTs navigate the nuances of reflection and reflective practice (i.e., questioning, integrating new ideas and looking for new alternatives) ultimately enhancing their understanding and leading them to reframe their initial perspectives. This resignification was evident in their queries about the relevance of incorporating new elements into their reflections, such as considerations on 'thinking about other things,' 'getting more involved,' and 'taking responsibility for decision-making. Instead of merely conforming, PSTs began to seek reasons for what occurred in their experiences 'I know that in the next class since they don't like the subjects that day, I'll have to think of a class that they'll enjoy more (...)'.

This initial questioning was not an isolated incident but became a sustained practice.

As articulated in our theoretical framework, this suggests that PSTs were not merely questioning ideas in a sporadic manner, but were consistently exploring new alternatives. This sustained engagement indicates a genuine awareness and understanding of the reflection process. While the literature often emphasizes the importance of deconstructing and reconstructing experiences for effective reflection, it commonly overlooks the initial misconceptions that PSTs may have [14]. Our approach addresses this gap by focusing on the PSTs' initial understanding, thus providing a more rounded view of how reflection and reflective practice concepts can be meaningfully internalized. Our findings suggest that gaining a robust initial understanding of the concept of reflection and critical reflection not only enabled PSTs to truly value the concept, but also served as a strong foundation for them to reframe their thinking about their teaching-learning practices (Marshall, 2019; Moon, 2013). However, PSTs still seemed to struggle with incorporating additional elements of critical reflection, such as consideration of others and the context, into their critical reflection process.

During the third AR cycle, the facilitator recognized that although the PSTs were aware of the challenges of critical reflection, they had not yet fully understood its significance for developing self-awareness (i.e., incorporating self, others and context when analyzing issues). Building on the PSTs' existing

theoretical understanding of reflection, the facilitator turned the focus towards deconstructing their teaching-learning practice to illuminate how theory could be operationalized.

For instance, the facilitator encouraged peer observation to help PSTs realize the necessity of having multiple solutions for the same problem (i.e., incorporating others when analyzing issues). Through this exercise, PSTs grasped not only the importance of being prepared with various strategies but also recognized that analyzing a situation from multiple perspectives is a form of critical reflection. Similarly, when the facilitator prompted PSTs to explain specific events previously documented in their reflective journals, the strategy proved to be effective in enhancing their understanding of the continuous nature of reflection (i.e., uncovering the ongoing nature of reflection). This was crucial for grasping an advanced level of awareness about meaning of critical reflection. It not only enabled them to transition from a theoretical understanding but also to develop their own personally situated meanings (i.e., formulating fresh, unique personal meanings), which were based on different problems specific to their teaching practice, and initiate their practical application.

This advancement resonated with existing literature, such as Liu (2015) and Szenes and Tilakaratna (2021), emphasizing self-knowledge and the transformative power of reflection. This skill development allowed them to construct practical frameworks for understanding their roles, highlighting the ongoing need for reflective practice for professional growth. Although recent studies have emphasized the importance of a situated perspective on reflection, the development of reflection among PSTs has often been limited to their portfolios, lacking individualized guidance or additional support (Chye et al., 2021). In our study, the individualized support promoted PSTs incorporating self, others, and context when analyzing issues. They made deliberate choices based on reasoning and method: 'I don't blame everyone and everything now, I know that above all, I am the one steering the ship, so I assume my decisions (...)'.

Our study highlighted that reflection tends to be a blind spot for PSTs in PE, especially concerning their understanding of it. These findings illuminate the pressing necessity for an initial analysis and understanding of how PSTs actually

comprehend what reflection means and how they apply it to their own teaching-learning experiences. Drawing on the PSTs' initial understanding, facilitated by the EF's ongoing, flexible, situated, and contextualized support, the EF engaged them in a process to deconstruct the meaning of reflective thinking. This approach enables PSTs to engage intimately in reflective activities directly linked to their experiences, aligning with literature that advocates for the effectiveness of personally meaningful practice in grasping re-flection (Moon, 2013). The facilitator used practical examples to deconstruct theory, enhancing the PSTs' understanding of reflection. Conversely, practice was analyzed to illustrate how theoretical concepts could be applied. This bidirectional approach enriched the PSTs' reflection by enabling them to reframe their initial understandings based on practical application.

Despite making progress in understanding the three different concepts of reflection, PSTs continued to struggle with incorporating their own perspectives in problem analysis. This challenge highlights the necessity for the facilitator's work to be personalized, adapted, and individualized to meet their specific needs.

6. Final thoughts

Across the three AR-cycles, our findings underscore the significance of deconstructing reflection concepts through meaningful experiences of PSTs, such as during their practicum. This approach catalyzed the reflection process, as the facilitator prompted PSTs to scrutinize their actions and decisions in authentic contexts. By addressing practical and relevant issues, PSTs grasped the applicability of reflection concepts in their own experiences, imbuing them with tangible meaning.

In sum, our research highlights the importance of integrating reflection concepts into practical and challenging situations PSTs face. By merging theoretical concepts with real-world practice, PSTs internalized reflection concepts more profoundly and developed the ability to apply them critically and intentionally in their teaching-learning activities. However, our study also underscores the necessity for systemic changes in teacher education. The role of facilitating advanced levels of reflective practice should not be limited to external facilitators alone; this role should also be integrated into the

responsibilities of cooperating teachers. To effectively assume this role, cooperating teachers can pursue various avenues for professional learning, including but not limited to specialized training, self-guided educational initiatives, mentorship from peers, collaboration with educational facilitators, and the employment of technological solutions for structured reflection.

Appendix B

Figure A1

References

1. Liesa, E.; Mayoral, P.; Giralt-Romeu, M.; Angulo, S. Video-Based Feedback for Collaborative Reflection among Mentors, University Tutors and Students. *Education Sciences* **2023**, *13*, 879, doi:<https://doi.org/10.3390/educsci13090879>.
2. Osmanović-Zajić, J.; Maksimović, J.Ž. Contemporary teachers' action research: Basis for the development of reflective practice in education. *Istraživanja u pedagogiji* **2020**, *10*, 354-366, doi:<https://www.ceeol.com/search/article-detail?id=926015>.
3. De Beer, J. Excursions as an Immersion Pedagogy to Enhance Self-Directed Learning in Pre-Service Teacher Education. *Education Sciences* **2023**, *13*, 862, doi:<https://doi.org/10.3390/educsci13090862>.
4. Hordvik, M.; MacPhail, A.; Ronglan, L.T. Negotiating the complexity of teaching: a rhizomatic consideration of pre-service teachers' school placement experiences. *Physical Education and Sport Pedagogy* **2019**, *24*, 447-462, doi:10.1080/17408989.2019.1623189.
5. Minott, M. Reflective teaching, inclusive teaching and the teacher's tasks in the inclusive classroom: A literary investigation. *British Journal of Special Education* **2019**, *46*, 226-238, doi: <https://doi.org/10.1111/1467-8578.12260>.
6. Mulryan-Kyne, C. Supporting reflection and reflective practice in an initial teacher education programme: An exploratory study. *European Journal of Teacher Education* **2021**, *44*, 502-519, doi:<https://doi.org/10.1080/02619768.2020.1793946>.
7. Attar, H.; Shahabi, S.M.; Reza; Mohammadi, K.O., Mahdis. Reform by reflection: Schön's legacy to management practice in times of uncertainty. *Iranian Journal of Management Studies* **2016**, *9*, 579-597.
8. Acquah, E.O.; Commins, N.L. Critical reflection as a key component in promoting pre-service teachers' awareness of cultural diversity. *Reflective Practice* **2015**, *16*, 790-805, doi:10.1080/14623943.2015.1095729.
9. Schön, D.A. *Educating the reflective practitioner*; Jossey-Bass: San Francisco, CA, 1987.
10. Azevedo; Araújo; Mesquita. The development of reflective skills in physical education teacher education: a systematic review. *Retos: nuevas tendencias en educación física, deporte y recreación* **2022**, *46*, 162-178, doi:<https://doi.org/10.47197/retos.v46.94080>.

11. Azevedo, E.L.; Fernandes, C.S.V.; Araújo, R.M.F.; Ramos, A.G.A.; Mesquita, I.M.R. How can a facilitator's caring approach trigger and deepen pre-service teachers' reflection on their pedagogical practice? A year-long action research study. *Reflective Practice* **2023**, *1*, 1-13, doi:<https://doi.org/10.1080/14623943.2023.2264213>.
12. Capel, S. Moving beyond physical education subject knowledge to develop knowledgeable teachers of the subject. *The Curriculum Journal* **2007**, *18*, CURJ09585170701687936, doi:<https://doi.org/10.1080/09585170701687936>.
13. Standal, Ø.F.; Moe, V.F. Reflective practice in physical education and physical education teacher education: A review of the literature since 1995. *Quest* **2013**, *65*, 220-240, doi:<https://doi.org/10.1080/00336297.2013.773530>.
14. Moore-Russo, D.A.; Wilsey, J.N. Delving into the meaning of productive reflection: A study of future teachers' reflections on representations of teaching. *Teaching and Teacher Education* **2014**, *37*, 76-90, doi:<https://doi.org/10.1016/j.tate.2013.10.002>.
15. Samuels, M.; Betts, J. Crossing the threshold from description to deconstruction and reconstruction: using self-assessment to deepen reflection. *Reflective Practice* **2007**, *8*, 269-283, doi:10.1080/14623940701289410.
16. Azimi, E.; Kuusisto, E.; Tirri, K.; Hatami, J. How do student teachers reflect on their practice through practicum courses? A case study from Iran. *Journal of Education for Teaching* **2019**, *45*, 277-289, doi:10.1080/09589236.2019.1599511.
17. Mesquita, I.; Ribeiro, J.; Santos, S.; Morgan, K. Coach Learning and Coach Education: Portuguese Expert Coaches' Perspective. *Sport Psychologist* **2014**, *28*, 124-136.
18. Liu. Critical reflection as a framework for transformative learning in teacher education. *Educational Review* **2015**, *67*, 135-157, doi:<https://doi.org/10.1080/00131911.2013.839546>.
19. Greve, S.; Weber, K.E.; Brandes, B.; Maier, J. What Do They Reflect on?—A Mixed-Methods Analysis of Physical Education Preservice Teachers' Written Reflections After a Long-Term Internship. *Journal of Teaching in Physical Education* **2021**, *41*, 590-600, doi:<https://doi.org/10.1123/jtpe.2021-0103>.
20. Peralta, L.R.; Bennie, A.; Gore, J.; Lonsdale, C. An Investigation of the Influence of Video Types and External Facilitation on PE Inservice Teachers' Reflections and Their Perceptions of Learning: Findings From the AMPED Cluster Controlled Trial. *Journal of Teacher Education* **2021**, *72*, 368-380, doi:<https://doi.org/10.1177/0022487120964079>.
21. Moon. *A handbook of reflective and experiential learning: Theory and Practice*; Routledge: London, 2004.
22. Chye, S.; Zhou, M.; Koh, C.; Liu, W.C. Levels of reflection in student teacher digital portfolios: a matter of sociocultural context? *Reflective Practice* **2021**, *22*, 577-599, doi:10.1080/14623943.2021.1937976.
23. Vesterinen, O.; Toom, A.; Krokfors, L. From action to understanding – student teachers' learning and practical reasoning during teaching practice. *Reflective Practice* **2014**, *15*, 618-633, doi:10.1080/14623943.2014.900028.
24. Larrivee, B. Meeting the challenge of preparing reflective practitioners. *The New Educator* **2008**, *4*, 87-106, doi:<https://doi.org/10.1080/15476880802014132>.

25. Gomes, R.; Jones, R.L.; Batista, P.; Mesquita, I. Latent learning in the work place: The placement experiences of student-coaches. *Sport, Education and Society* **2018**, *23*, 68-81.
26. Miller, P.E. Reflection-in-action: the use of student audio recordings. *Social Work Education* **2022**, *1-15*, doi:<https://doi.org/10.1080/02615479.2022.2031961>.
27. Foong, L.Y.Y.; Nor, M.B.M.; Nolan, A. The influence of practicum supervisors' facilitation styles on student teachers' reflective thinking during collective reflection. *Reflective Practice* **2018**, *19*, 225-242, doi:10.1080/14623943.2018.1437406.
28. Zhu. Student teachers' reflection during practicum: Plenty on action, few in action. *Reflective Practice* **2011**, *12*, 763-775, doi:<https://doi.org/10.1080/14623943.2011.601097>.
29. Ruffinelli, A.; Álvarez Valdés, C.; Salas Aguayo, M. Strategies to promote generative reflection in practicum tutorials in teacher training: The representations of tutors and practicum students. *Reflective Practice* **2022**, *23*, 30-43, doi:10.1080/14623943.2021.1974371.
30. Prado, E.L.-d.-A.; Gorrotxategi, A.M.; García, N.A.; Pérez, M.B. More about strategies to improve the quality of joint reflection based on the theory-practice relationship during practicum seminars. *Reflective Practice* **2019**, *20*, 790-807, doi:10.1080/14623943.2019.1690982.
31. Nelson, F.L.; Miller, L.R.; Yun, C. 'It's OK to feel totally confused': reflection without practice by preservice teachers in an introductory education course. *Reflective Practice* **2016**, *17*, 648-661, doi:<https://doi.org/10.1080/14623943.2016.1197113>.
32. Østerlie, O.; Kristensen, G.O. Norwegian Physical Education Teacher Education Students' Perceptions of the Subject Physical Education: A Qualitative Study of Students' Reflections before Starting Their Studies. *Education Sciences* **2023**, *13*, 499, doi:10.3390/educsci13050499.
33. Marshall, T.; Keville, S.; Cain, A.; Adler, J.R. Facilitating reflection: a review and synthesis of the factors enabling effective facilitation of reflective practice. *Reflective Practice* **2022**, *23*, 483-496, doi:10.1080/14623943.2022.2064444.
34. Vogelsang, C.; Kulgemeyer, C.; Riese, J. Learning to Plan by Learning to Reflect?—Exploring Relations between Professional Knowledge, Reflection Skills, and Planning Skills of Preservice Physics Teachers in a One-Semester Field Experience. *Education Sciences* **2022**, *12*, N.PAG-N.PAG, doi:10.3390/educsci12070479.
35. Jones, M.m.j.a.e.a.; Ryan, J. Learning in the practicum: engaging pre-service teachers in reflective practice in the online space. *Asia-Pacific Journal of Teacher Education* **2014**, *42*, 132-146, doi:10.1080/1359866X.2014.892058.
36. Farias, C.; Hastie, P.A.; Mesquita, I. Scaffolding student-coaches' instructional leadership toward student-centred peer interactions: A yearlong action-research intervention in sport education. *European Physical Education Review* **2018**, *24*, 269-291, doi:<https://doi.org/10.1177/1356336X16687303>.
37. Gonçalves, L.L.; Parker, M.; Luguetti, C.; Carbinatto, M. The facilitator's role in supporting physical education teachers' empowerment in a professional learning community. *Sport, Education and Society* **2022**, *27*, 272-285,

doi:<https://doi.org/10.1080/13573322.2020.1825371>.

38. Verwoerd, L.; Klaassen, P.; van Veen, S.C.; De Wildt-Liesveld, R.; Regeer, B.J. Combining the roles of evaluator and facilitator: Assessing societal impacts of transdisciplinary research while building capacities to improve its quality. *Environmental Science & Policy* **2020**, *103*, 32-40, doi:10.1016/j.envsci.2019.10.011.
39. McKernan, J. *Curriculum action research: A handbook of methods and resources for the reflective practitioner*; Psychology Press: 1996.
40. Dewey, J. How We Think. *Journal of Education* **1933**, *116*, 321-321.
41. Marshall, T. The concept of reflection: a systematic review and thematic synthesis across professional contexts. *Reflective Practice* **2019**, *20*, 396-415, doi:<https://doi.org/10.1080/14623943.2019.1622520>.
42. Moon. *Reflection in learning and professional development: Theory and practice*; Routledge: 2013.
43. Clarà, M. What is reflection? Looking for clarity in an ambiguous notion. *Journal of teacher education* **2015**, *66*, 261-271, doi:<https://doi.org/10.1177/0022487114552028>.
44. Hatton, N.; Smith, D. Reflection in teacher education: Towards definition and implementation. *Teaching and teacher education* **1995**, *11*, 33-49, doi:[https://doi.org/10.1016/0742-051X\(94\)00012-U](https://doi.org/10.1016/0742-051X(94)00012-U).
45. Sandelowski, M. Whatever happened to qualitative description? *Research in nursing & health* **2000**, *23*, 334-340, doi:[https://doi.org/10.1002/1098-240X\(200008\)23:4%3C334::AID-NUR9%3E3.0.CO;2-G](https://doi.org/10.1002/1098-240X(200008)23:4%3C334::AID-NUR9%3E3.0.CO;2-G).
46. Weed, M. Research quality considerations for grounded theory research in sport & exercise psychology. *Psychology of sport and exercise* **2009**, *10*, 502-510, doi:<https://doi.org/10.1016/j.psychsport.2009.02.007>.
47. Lewin, K. Action research and minority problems. *Journal of social issues* **1946**, *2*, 34-46.
48. Cooke, B.; Cox, J.W. *The Fundamentals of Action Research, Volume 3: Social Change Applications, the Practitioner, and Action Research Knowledge (Sage Benchmarks in Social Research Series)*; Sage: 2005.
49. Gilbourne, D. Collaboration and reflection: Adopting action research themes and processes to promote adherence to changing practice. *Bull, S. (Ed.), Adherence Issues in Sport and Exercise. Chichester, England: John Wiley & Sons Ltd.* **1999**, 239-262.
50. Kemmis, S. What is to be done? The place of action research. *Educational Action Research* **2010**, *18*, 417-427, doi:<https://doi.org/10.1080/09650792.2010.524745>.
51. Casey, A.; Fletcher, T.; Schaefer, L.; Gleddie, D. *Conducting practitioner research in physical education and youth sport: Reflecting on practice*; Routledge: 2017.
52. Sarstedt, M.; Bengart, P.; Shaltoni, A.M.; Lehmann, S. The use of sampling methods in advertising research: a gap between theory and practice. *International Journal of Advertising* **2018**, *37*, 650-663, doi:10.1080/02650487.2017.1348329.
53. Patton, M.Q. *Qualitative research & evaluation methods: Integrating theory and practice.* **2015**.
54. Morgan, D.L. *Focus group as qualitative research*, 2nd ed.; Sage:

Newbury Park, CA, 1997.

55. Kreijns, K.; Kirschner, P.A.; Vermeulen, M. Social aspects of CSCL environments: A research framework. *Educational Psychologist* **2013**, *48*, 229-242, doi:<https://doi.org/10.1080/00461520.2012.750225>.
56. Emerson, R.; Fretz, R.; Shaw, L. Participant Observation and Fieldnotes. In *Handbook of Ethnography*, Atkinson, P., Coffey, A., Delamont, S., Lofland, J., Lofland, L., Eds.; SAGE Publications: London, 2001; pp. 352-368.
57. Öhman, M.; Quennerstedt, M. Observational studies: Marie Öhman and Mikael Quennerstedt. In *Research Methods in Physical Education and Youth Sport*; Routledge: 2012; pp. 192-206.
58. De Martin-Silva, L.; Fonseca, J.; Jones, R.; Morgan, K.; Mesquita, I. Understanding undergraduate sports coaching students' development and learning: the necessity of uncertainty. *Teaching in Higher Education* **2015**, *20*, 669-683, doi:<https://doi.org/10.1080/13562517.2015.1072153>.
59. Braun, V.; Clarke, V. Reflecting on reflexive thematic analysis. *Qualitative Research in Sport, Exercise and Health* **2019**, *11*, 589-597, doi:10.1080/2159676X.2019.1628806.
60. Greenwood, D.; Levin, M. Reconstructing the relationship between universities and society through action research. In *The landscape of qualitative research: Theories and issues*, 2nd ed.; N.Denzin, Lincoln, Y., Eds.; SAGE: Thousand Oaks, 2003; pp. 131-166.
61. Holter, I.M.; Schwartz-Barcott, D. Action research: what is it? How has it been used and how can it be used in nursing? *Journal of advanced nursing* **1993**, *18*, 298-304, doi:<https://doi.org/10.1046/j.1365-2648.1993.18020298.x>.
62. Braun, V.; Clarke, V. One size fits all? What counts as quality practice in (reflexive) thematic analysis? *Qualitative Research in Psychology* **2021**, *18*, 328-352, doi:10.1080/14780887.2020.1769238.
63. Braun, V.; Clarke, V. (Mis) conceptualising themes, thematic analysis, and other problems with Fugard and Potts'(2015) sample-size tool for thematic analysis. *International Journal of social research methodology* **2016**, *19*, 739-743, doi:<https://doi.org/10.1080/13645579.2016.1195588>.
64. Nowell, L.S.; Norris, J.M.; White, D.E.; Moules, N.J. Thematic Analysis: Striving to Meet the Trustworthiness Criteria. *International Journal of Qualitative Methods* **2017**, *16*, 1-13, doi:10.1177/1609406917733847.
65. Coghlan, D. *Doing action research in your own organization*; Sage: 2019.
66. Denzin, N.K. Triangulation 2.0. *Journal of Mixed Methods Research* **2012**, *6*, 80-88, doi:10.1177/1558689812437186.
67. Efron, S.E.; Ravid, R. *Action research in education: A practical guide*; Guilford Publications: 2019.
68. Szenes, E.; Tilakaratna, N. Deconstructing critical reflection in social work and business: Negotiating emotions and opinions in reflective writing. *Journal of English for Academic Purposes* **2021**, *49*, 100931, doi:<https://doi.org/10.1016/j.jeap.2020.100931>.

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Empirical Article 2

How can a facilitator's caring approach trigger and deepen pre-service teachers' reflection on their pedagogical practice? A year-long action research study

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Abstract

Throughout a year-long Action Research (AR) conducted in Physical Education Teacher Education, this study explored how a facilitator's caring approach can help develop strategies and create circumstances to enhance and deepen Pre-Service Teachers' (PSTs) reflection on their pedagogical practice. Participants included six PSTs and the first author, who assumed the dual role of external facilitator (EF) and researcher. Three action research-cycles were conducted, enabling the EF to analyze the needs and thoughts of PSTs thoroughly. This allowed EF to tailor her interventions to developed strategies and created circumstances that triggered and deepened the PSTs' reflection. Qualitative data collected through focus group interviews, informal interviews, reflective journals, and field notes guided the EF's strategic progression in each AR-cycle through thematic analysis to design subsequent interventions. Through the ongoing AR-cycles, the facilitator underwent a strategic evolution propelled by PSTs' needs and thoughts. Specifically, PSTs' reflections transitioned from conformity to autonomy, which embraced multifaceted analysis, transcending consensus. It is recommended that Physical Education Teacher Education programs incorporate a customized caring environment that nurtures vulnerability, fosters the development of trusting relationships, and is responsive to the unique learning context.

Keywords: reflective practice; ethics of care; initial teacher education; facilitator; action research

Introduction

Physical Education Teacher Education demands future teachers to be reflective practitioners due to its complex practice nature (Østergaard, 2019). However, to achieve this goal, research has shown that the reflection process is not only based on a cognitive dimension (i.e. thoughtful, active and conscious) (Dewey, 1933b) but also an emotional dimension (i.e. trusting relationship, vulnerability). Indeed, Boud et al. (2013) claimed that reflection could only lead to an effective learning process if the emotions associated with the event are considered. Although research on Physical Education Teacher Education has focused on emotions (Klemola et al., 2013), exploring both dimensions of the reflection process remains scarce.

When PSTs engage in reflection, they undergo intense emotions as they must confront their insecurities, problems, and weaknesses (Schön, 1987). Consequently, reflection proclaims a receptive state in PSTs that enables them to discover, expose, and self-criticize themselves individually and collectively (L. Foong et al., 2018). This emotional state intensifies when PSTs undergo their practicum, involving continuous assessment (De Martin-Silva & Mesquita, 2016), leading to feelings of overwhelm, stress, and vulnerability (Gray et al., 2017). To help PSTs confidently address teaching challenges (Moussaid & Zerhouni, 2017), the practicum should offer a secure, well-supported, and motivational environment, allowing them to embrace the inherent vulnerability in the process of reflection wholeheartedly (Béres, 2019). In this regard, there is a noticeable gap in the Physical Education Teacher Education literature to find strategies to address PSTs' needs and enable the development of reflective practitioners during their practicum.

Attempting to bridge this gap, teacher educators have been exploring a caring approach, termed the 'pedagogy of love' by Darder (2017). This approach encompasses a range of relational practices that promote mutual recognition between 'the caregiver' and 'the cared-for'. Hence, caring has the potential to create a safe, supportive, and blame-free environment that allows PSTs to find comfort, reveal their weaknesses and then reflect on them without fear of being judged (Lugueti et al., 2019). Caring teaching is inherently built upon cultivating

strong relationships (Moen et al., 2020). It functions as a mutual aid network in which we learn from others (i.e. awareness of others) and teach others about ourselves, our perspectives, and our understandings (i.e. self-awareness) (Luke, 1996). This kind of support can be offered by a more 'caring person', specifically a facilitator who can grasp the distinct needs of PSTs (such as their learning level and personal goals).

Although caring has been considered paramount, prior research in teacher education has examined actions (Simel Pranjic, 2021), components (Barrow, 2015), or relationships that foster caring (Moen et al., 2020). Similarly, research emphasizes how reflection can enhance (Schwind & Manankil-Rankin, 2020), comprehend (Ugalingan et al., 2022), or integrate emotions (Marathe & Sen, 2021) but overlooks the support for these processes. Hence, there is still a scarce connection between the mechanisms underpinning caring and reflection processes.

Hence, the combination of proper support and the mutual aid network can cultivate a climate of caring that encourages the flourishing of relationships (Noddings, 2012) and the development of a pedagogy of care (i.e. to listen, show empathy) (Walker & Gleaves, 2016). Using a caring approach during practicum can transform it into a pedagogical space for PSTs (Flores & Alfaro, 2022), where they can express their uncertainties, confront their challenges, and expose their vulnerabilities. This, in turn, can further enrich the emotional and cognitive facets of the reflective process. A nurturing environment empowers PSTs to step out of their comfort zones, embarking on a voyage of self-discovery and growth where the fear of judgment is replaced by an atmosphere of trust and support (Moffatt et al., 2016).

To the best of our knowledge, there is a noticeable gap in the Physical Education Teacher Education literature in terms of examining the integration of a caring approach to foster the development of reflection, as well as exploring the role of facilitators in developing PSTs' reflective practices. Due to its interactive, cyclical, and contextual nature, AR was employed as a study design to explore these questions, given the intervening nature of this study (Hunuk & MacPhail, 2022). Accordingly, through a year-long AR conducted in the Physical Education

Teacher Education context, this study examined how the facilitator, engaging in a caring approach, developed strategies and created circumstances that triggered and deepened the PSTs' reflection on their pedagogical practice.

Methods

Study design

The EF conducted AR to grasp the PSTs' concerns and offer tailored support guided by a caring approach. Drawing from the reflective, collaborative, and interventionist nature of AR (Cooke & Cox, 2005), the EF conducted three sequential self-reflection cycles (i.e. plan, act, evaluate, and reflect). This study is underpinned by the belief that knowledge is socially constructed and reality is multi-layered and subjective, aligning with the principles of epistemological constructionism (Weed, 2009).

Firstly, EF diagnoses PSTs' reflection, identifying the main issues they faced during their teaching practice. In the second AR-cycle, EF built a trusting relationship with PSTs, allowing them to share their true thoughts and feelings. In the last AR-cycle, EF presented PSTs strategies tailored to help them develop their reflections and feel confident. The facilitator carefully analyzed the PSTs' expressed thoughts, written reflections, and observed lessons, enabling a comprehensive comprehension of the topics that warranted exploration in subsequent interventions (Gilbourne, 1999a). Each AR-cycle corresponded to one of the three school semesters.

Context and Participants

The study encompassed six PSTs who were part of a two-year Physical Education Teacher Education Programme, with an AR being implemented during their second year (i.e. practicum). The PSTs received supervision from a cooperating teacher (CT) at the host school and a faculty supervisor. Selection of PSTs was based on criteria including purpose and convenience sampling (Sarstedt et al., 2018), availability, and willingness to participate. The first author assumed the dual role of researcher and EF over three AR-cycles (Coghland, 2019). The EF holds a master's degree in PE and is a researcher specializing in

this field. Participants were informed about the research's scope and their right to withdraw at any point, and anonymity was ensured through pseudonyms. The study adhered to the Declaration of Helsinki's guidelines and gained approval from the Institutional Research Ethics Committee of the primary author's institution.

Data collection

Data was collected from multiple qualitative methods to deepen the understanding of how EF tailored a caring approach to deepen the PSTs' reflection. Namely three semi-structured focus groups and informal interviews (one per AR-cycle), 18 participant observations and reflective journals completed by the PSTs (three per PST).

In each AR-cycle, the EF held one focus group session (Patton, 2015) based on a list of questions/topics prepared for discussion (i.e. *'What is your approach to problem analysis, and what elements do you integrate?'*). Any new themes that emerged during the dialogues were also explored (Freebody & Freiberg, 2006). Focus group interviews were conducted to explore PSTs' thoughts, doubts and feelings about their teaching practice and to deepen their reflection by clarifying ideas that were not so clear (Patton, 2015). The EF conducted individual interviews avoiding pressure or assessment, offering a secure environment to deepen the previous discussions (Roulston & Choi, 2018).

EF conducted participant observations in PSTs' practicum through field notes. The purpose was to help the EF understand how the PSTs' thoughts were expressed in their teaching practice and to access any issues related to practice that could not be verbalized (Öhman & Quennerstedt, 2012). These observations were crucial to understanding how reflective growth manifested in teaching-learning situations. Using this information, EF designed caring actions to build trust to promote PSTs' reflection.

The PSTs made 18 reflective journals after class on the topics proposed by the EF to: (i) enable a better understanding and organization of their ideas, (ii) reflect on non-verbalized thoughts to create awareness of teaching practice (Khanjani et al., 2018). Recognizing the inherent risk in writing about very intimate

personal experiences, which required PSTs to be honest and authentic (Pavlovich, 2007), the EF also shared her own reflective journal from when she was a PST. Initially, the PSTs wrote autonomously and freely, and later in the process, the EF asked them to write about specific issues identified in their practice. These methods were deliberately chosen to attain a comprehensive and nuanced grasp of PSTs' reflective development.

Data analysis

To allow the researcher to identify, analyze and report patterns (or themes) within a large dataset, the thematic analysis (Braun & Clarke, 2019). was employed, utilizing a hybrid approach to theme development for data analysis (Nowell et al., 2017). Initially, deductive analysis allowed the EF's engagement in formulating the research aims and designing appropriate caring actions.

The first research stage involved the researcher immersing in the dataset and reading it extensively. Secondly, coding was done manually to identify critical categories in focus groups, informal interviews, reflective journals and participant observations. This process evolved with a view to the pre-existing research objectives (deductive) and openness to new segments (inductive). In this phase, text units with similar meanings were grouped into themes and sub-themes through focused coding and the data was also reviewed by all co-authors. Written notes were added to help interpret EF's care actions in PSTs' reflections. The third and fourth phases of analysis linked existing data sets to PSTs' reflection, EF's caring actions, and working back and forth between data and theory. At the same time, the final stage looked for patterns to support or contradict existing assumptions.

Trustworthiness

An AR design must acknowledge the issues of subjectivity and trustworthiness in data interpretation (Coghland, 2019). Therefore, to reduce individual research bias (Nowell et al., 2017) and increase research quality, five main strategies were used: data triangulation among the data gathered from all resources (Denzin, 2012); continuous stakeholder evaluation through regular

peer debriefings between the first author and co-authors; and PSTs being questioned about the implicit meaning of their reports (Patton, 2015); acknowledging subjectivity by recognizing the EF's personal preconceived notions about the study and maintaining reflexivity to monitor biases; and utilizing thick descriptions to enable the audience to authentically perceive the participants' views and immerse themselves in their world (Efron & Ravid, 2019).

Results

First AR-cycle – reproducing and not reflecting – ‘what’s underneath PSTs’ pedagogical practice?’

At the beginning, the EF could not access the PSTs' ideas through a careful and attentive analysis of their responses, as their answers were short, uncommitted and in line with those of their peers: *'Gustavo – Yes, I agree. It's the same as my colleagues...'*

Paulo - (...) also because the difficulties at the beginning are part of the process.' Additionally, the inability to reflect was also evident: *'Sara - I think I met all the objectives of the course, I even always mentioned the success criteria during the class.'* (1st focus group)

At the same time, the PSTs' written reflection contained rehearsed (not genuine) thoughts without showing their accurate opinions and without engaging and/or contributing. In this way, they did not take risks and chose to protect themselves by giving peripheral, formal speeches that left no room for other perspectives: *'Gustavo – As for this lesson, I believe that my commitment was in line with the planning of the content of unit ... I can conclude that I'll keep this method because it's effective.'* (1st reflective journal)

During these first classes, the EF also noticed that the PSTs were inhibited in her presence and adopted a mechanized, controlled, and unnatural posture: *'EF – strangely enough, as soon as the PSTs saw me, they immediately sat down and were silent, it seemed as if they didn't know how to sit, where to look (...)'* (1st participant observation)

The first AR-cycle revealed the need to build the first facilitator intervention towards building a trusting relationship and a safe space for discussion.

Second AR-cycle – the EF's vulnerability in getting the PSTs to be wholeheartedly involved in reflection – 'I was just like you...'

Given the inhibition of the PSTs diagnosed in the previous cycle, the EF had to establish a an 'intimate space' with the group to access the genuine thoughts of the PSTs. Thus, the EF verbalized her vulnerability through a transparent, honest and direct exchange about her position and engagement with the group: *'EF – if we're all in this group, it's because we want to learn, myself included (...) speaking to a group of people isn't always easy... to expose ourselves, to risk criticism (...)'* In addition, the EF shared the apprehension she felt while interacting with them and in performing her role which help the PSTs connect with their own insecurity in the discussions: *'(...) the way I ask you questions is also an act of courage, just like you, when you ask me questions or share your ideas, fears and frustrations with me, you must also be courageous (...)'*

However, at the end of the focus group, some comments indicated that PSTs did not believe in the fragility of the EF: *'Gustavo – oh what you say makes perfect sense to me, but we are still the learning, and you already went through that' (2nd focus group).*

For this reason, the EF understood that she needed to spend more time with the PSTs in informal registers to build a trusting relationship. This sociability progressively led to a more authentic interaction in which the PSTs began to show their ideas from their perception of pedagogical practice: *'Gustavo – Yesterday I went home thinking that the internship (practicum) is now a huge part of my life and it's constantly in my mind.'* (1st informal interview)

To move towards more specific information from the PSTs' perceptions the EF shared some of her reflective journals as a PST: *'EF – today I decided to bring you some of my diaries that I made at the beginning of the internship (...) if you notice that my initial difficulties were so basic (...) you can see what they were (...) look, at that stage I also thought like that, had the same difficulties (...).'*

The disclosure of the problems the EF experienced as PST and the similarity to those of the PSTs generated a wave of empathy, fostered a connection among the PSTs, and prompted them to open up and freely express

their perspectives about their pedagogical practice: *'Antônio – well, I never thought of that in that sense, and I believe we are all shocked (...) I can also empathize with your past worries. I've so many doubts in different topics, but I thought I was the only one.'*

The PSTs were not only able to recognize the problems of their pedagogical practice but also the need to look at them as opportunities, in contrast to the previous cycle: *'Gustavo – I think I must now reconsider my reflections (...) I must admit that there are several aspects that may change my analysis of the lesson.'* (2nd focus group)

Nonetheless, some PSTs still had inhibitions about sharing their problems and covered themselves by only sharing issues related to classroom organization and planning: *'Maria – I need to plan better and follow this organization in class'*, which showed that the relationship of trust with the EF had not yet been fully established. Therefore, the EF understood that she had to perform more actions to help approach all PSTs and allow them to accept her support. To this end, the EF decided played the same role as the PSTs in their pedagogical practice. For example, in the moments leading up to the PSTs' lessons, the EF helped prepare the materials for the lessons: *'EF – (...) I ordered the material for the pavilion, organized the arches and drew the lines on the ground.'*; reviewed the lesson plan with the PSTs: *'Together we remembered all the key points of the plan.'* and wrote the class reports simultaneously with the PSTs: *'(...) together with colleagues who attended the lessons, I also wrote a report on lesson observation.'*

Gradually, the EF motivated the PSTs by showing herself as someone who understood the PSTs' problems from their own experience: *'Sara – After all, you look like one of us, and it's easier to talk to you. That gives me strength.'* (2nd informal interview)

By the end of the second AR-cycle, the EF was able to spark in the PSTs the will to reflect and critically analyze their pedagogical practice to improve. Hence, PSTs began demonstrating their commitment to the analysis of their pedagogical practices: *'Maria: I've been looking for solutions to this problem, and I apply them in class. It doesn't always work out, but I try (...).'*; however, still showed signs of self-doubt: *'Gustavo: sometimes I wonder if this is the way.'* (2nd reflective journal)

Hence, after building a trusting relationship, the EF finally had access to the PSTs personal fears and practice uncertainties, opening space to progress to a deeper level of intervention.

Third AR-cycle – creating adaptable and meaningful opportunities for PSTs' reflection tailored to their individuality – 'how can I create a strategy that fully engages PSTs based on their needs?'

At the end of the previous cycle, despite being more engaged the PSTs still showed different fears of revealing their weaknesses and failing to improve. Therefore, the EF recognized the need to adapt her actions to the individual characteristics of each PSTs (i.e. values, personality). For example, one of the PSTs revealed a particular aversion to writing: *'Gustavo – I hate writing, I think it's a lot of work and that I get nothing out of it.'* (3rd informal interview)

To meet the learning preferences of this PST and to provide alternative ways to express themselves, the EF requested that audios be recorded immediately after their teaching practice: *'EF – Gustavo, I had an idea that can help you organize your thoughts and then write the diary, which is to record an audio, it doesn't have to be anything very long. It is just your main thoughts and analysis of this class.'* Therefore, the EF got different shares of the PSTs' difficulties: *'EF – interestingly, the ideas you shared in the audio weren't the same ones in the diary.'* (3rd focus group) The PSTs explained that when they recorded their thoughts immediately after class, they did not have time to choose words or develop the best ideas, which allowed them to be authentic: *'Antônio – when I pick up the phone, it's really without a philtre, I sometimes don't even remember what I said, I just know that I've certainly said anything that worried me in that class or that I need to pay more attention.'*

Consequently, the audio-recorded post class reflections also fostered internal debate about the PSTs' self-weaknesses: *'Gustavo - (...) it's me against me, I'm not sure if what I used to think was right. Maybe I need to change my view on the most fundamental questions.'* Although the PSTs demonstrated the ability to analyze their practices and themselves without judgment (i.e. whether they were good or bad), some of them could not relate their thoughts or

understand the impact of their ideas on their practice: *'Sara – this student makes me very uncomfortable, I don't know why he always has such a bad attitude.'* Then the EF suggested that PSTs listen to their audio and write about the main challenges. So, the PSTs showed the ability to structure their ideas: *'Maria – After looking at my recordings, I realized that I hadn't linked the behaviour of the three most problematic students to my interventions. In this case, I think giving them extra attention during class could make them to feel more welcome and liked by everyone.'* (3rd reflective journal)

Simultaneously, the EF noted that PSTs took responsibility and autonomy for their actions without her intervention: *'EF – Maria's independence in decision making is evident, at no point did she have to ask for help or refer back to the lesson plan, although she changed the lesson plan several times, she took on the consequences of her decisions without having to attribute them to anyone.'* (3rd participant observation)

By the end of this AR project, PSTs were revealing the ability to engage in the analysis of their pedagogical practices and to understand themselves as a fundamental element of the process, integrating and relating different possibilities in their thinking: *'Gustavo - I understand now that my analysis of the classes can and must even suffer from fluctuations, it's not as bad as I thought before. For example, I changed a group like that from the beginning, and it did not work, but that does not mean I cannot change it again. I just should have realized that they were not friends, and it would not work, next time, I will have to take these aspects into account.'* (3rd reflective journal)

Discussion

Through a year-long AR conducted in the context of Physical Education Teacher Education, this study aimed to examine how an EF, engaging in a caring approach, developed strategies and created circumstances that triggered and progressively deepened the PSTs' reflection on their pedagogical practice. Overall, the study has shown that caring actions addressed by the EF helped PSTs developing their reflection. These strategies emerged from the ongoing needs and thoughts of the PSTs, and the circumstances of the PE practicum

context that enabled the caring approach to be developed in a contextualized way. Specifically, the PSTs evolved their initial reflection from not expressing their own opinions to a stage where they could engage in self-analysis autonomously. AR, in turn, through a 'spiralling', cyclical process (Kemmis, 1988), was crucial as it enabled the EF to keep up with the constant changes in the PSTs' thoughts and emotions and to adapt care actions to the PSTs' particularities, circumstances and emotions.

At the beginning of this project, the EF could not access the genuine thoughts of the PSTs where their reflection was shaped by '*what the others expected of me*'. This PSTs' defensive attitude contributed to a detachment from the reflection process. The 'cycle of fragility' reported in Dorman's study (2020, p. 1) related to the assessment environment that PSTs experience during the practicum might be a possible reason for them to adopt a protective attitude. However, the reflection process implies immersion in the analysis, interpretation, and evaluation of practice experiences (Zeichner & Liston, 1996). Here, the risk of discovering mistakes might contribute to PSTs' fear of losing control over their thoughts and actions and lead them to avoid reflection.

The use of vulnerability by the EF during the second AR-cycle showed to be an essential caring action to unlock the PSTs' insecurity state. Recently, Ostedgaard (2022) noted that the introduction of vulnerability humanizes people and can make it easier for individuals to make connections. That vulnerability is seen as fundamental in becoming a teacher (Eutsler & Curcio, 2019). Thus, creating an identity in which the EF verbalized her journey as a PST and participated in the PSTs' activities as one of them, was aimed to enable helping PSTs feel safe and recognize themselves. This is intrinsically linked to the emotional dimension, as it involves creating an environment that recognizes and expresses others' emotions (Boud et al., 2013).

Nevertheless, by the end of the second cycle of AR, the PSTs were still not able to analyze themselves autonomously, which is crucial to understand their strengths and weaknesses while being able to act critically and recognize their learning difficulties and opportunities (Slepcevic-Zach & Stock, 2018). Consequently, during the third AR-cycle, instead of adopting a 'one size fits all'

approach (Chesterfield et al., 2010), the EF's caring actions entailed learner-oriented pedagogies, leading PSTs to be more actively engaged in their thinking (Mesquita et al., 2015) and, consequently, stimulating their self-reflection.

In our study, not all PSTs followed a uniform path in their reflective journey. Despite the identified progression, it appears pertinent to mention that some of the PSTs' reflections were still basic. This aligns with the findings of Lindh and Thorgren's (2016) study, which underscored the importance of recognizing critical events as an initial step in initiating reflective learning. Similar to their study, our findings highlight the role of emotional engagement and cognitive openness in influencing the speed and depth of reflective growth. We also acknowledge that the progression in PSTs' reflective evolution could be ascribed to the intrinsic process of natural development within the Physical Education Teacher Education program. With this idea in mind, various personalized strategies were employed to address the diverse learning needs of each PST.

The EF played a pivotal role in fostering distinct paths of growth and development for every individual, providing concrete strategies to help them think and write about reflection. Firstly, through audio recording, PSTs could express their views about themselves less intrusively (Bergman, 2015). Here, the EF also aimed to protect the PSTs from expressing their thoughts publicly and thus avoiding the judgement associated with it. Our results showed that the intimacy created might be a potential tool for PSTs to be vulnerable, recognize their weaknesses and identify their pedagogical practice challenges. These findings are consistent with Fitt's (2018) work, who has shown that audio recordings can facilitate expression, particularly of emotions, and avoid the stifling effects of self-editing in written diaries.

Secondly, since PSTs could not systematize their reflection, the EF asked them to write in their reflection journals about specific problems of their practice identified by listening to the audio recordings to promote critical thinking as they begin to structure their ideas and develop autonomy (Tsangaridou & Polemitou, 2015). This strategy helped raise the quality of PSTs' written reflection throughout the caring supervision and support of the facilitator (Azevedo et al., 2022). These findings are consistent with recent work by Chen et al. (2018), which showed,

albeit in the context of nursing education, that caring contributes to critical thinking skills and that there is a relationship between self-reflection and critical thinking.

Over the practicum year, PSTs moved from one-sided thinking (i.e. merely doing what others expected) to many-sided reflection (i.e. being able to think for themselves, which opens multiple perspectives). Our findings suggest that the EF's caring actions were crucial, namely being vulnerable, cultivating a trusting relationship, being responsive to their learning context, aiming to meet each PST need and, in turn, providing conditions to encourage reflection (i.e. a non-judgmental and comfortable environment).

Conclusion

This work is significant for informing Physical Education Teacher Education programs, which should consider including the caring approach as a fundamental pedagogical strategy that should be reutilized from a critical perspective centred on the development of the PSTs and to encourage safe environments to promote reflection over time.

In practical terms, the findings suggest that future studies could: i) explore what strategies of caring there are and how caring can be developed in contexts of high demands and constant evaluation, such as practicum; ii) incorporate caring into their programs to encourage supervisors to create better conditions that help PSTs develop reflection; iii) develop appropriate caring strategies that are linked to PSTs' specific needs as well as to PSTs' capacity for reflection; and iv) promote designs that allow for monitoring, evaluation, and adaptation of caring actions to PSTs' needs and reflection. In this way, supervisors should receive the guidance, support, and learning necessary to understand reflection's cognitive and emotional dimensions and thus help PSTs deepen their reflection.

Care fosters a secure environment for reflective exploration and cultivates trust and resilience among PSTs. They feel acknowledged, heard, and supported, thereby mustering the courage to confront challenges and uncertainties in their educational journey. Highlighting the importance of care and attention can have far-reaching positive effects, improving pedagogical practices in various educational contexts. The repercussions may extend beyond the

classroom, positively influencing how they shape their own students' lives in the future. By prioritizing care and empathy, we acknowledge the inherent humanity within education.

Ultimately, this study's emphasis on these aspects in promoting reflective growth leaves a lasting impact on education, contributing to the field and sparking discussions on the role of emotions and care in shaping the future of education.

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References

- Azevedo, Araújo, & Mesquita. (2022). The development of reflective skills in physical education teacher education: a systematic review. *Retos: nuevas tendencias en educación física, deporte y recreación*, 46, 162-178. <https://dialnet.unirioja.es/servlet/articulo?codigo=8562027>
- Barrow, M. (2015, 09//). Caring In Teaching: A Complicated Relationship [Article]. *Journal of Effective Teaching*, 15(2), 45-59.
- Béres, L. (2019). Valuing Critical Reflection and Narratives in Professional Practice Wisdom. In *Practice wisdom* (pp. 277-288). Brill.
- Bergman, D. (2015, 04//Apr-Jun2015). Comparing the Effects of Classroom Audio-Recording and Video-Recording on Preservice Teachers' Reflection of Practice [Article]. *Teacher Educator*, 50(2), 127-144. <https://doi.org/10.1080/08878730.2015.1010054>
- Boud, D., Keogh, R., & Walker, D. (2013). *Reflection: Turning experience into learning*. Routledge.
- Braun, V., & Clarke, V. (2019, 2019/08/08). Reflecting on reflexive thematic analysis. *Qualitative Research in Sport, Exercise and Health*, 11(4), 589-597. <https://doi.org/10.1080/2159676X.2019.1628806>
- Chen, S. Y., Chang, H. C., & Pai, H. C. (2018, 03//). Caring behaviours directly and indirectly affect nursing students' critical thinking [Article]. *Scandinavian Journal of Caring Sciences*, 32(1), 197-203. <https://doi.org/10.1111/scs.12447>
- Chesterfield, G., Potrac, P., & Jones, R. (2010). "Studentship" and "Impression Management" in an Advanced Soccer Coach Education Award. *Sport, Education and Society*, 15(3), 299-314.

- Coghland, D. (2019). *Doing an action research in your own organization* (A. Owen, Ed. 5th ed.). SAGE.
- Cooke, B., & Cox, J. W. (2005). *The Fundamentals of Action Research, Volume 3: Social Change Applications, the Practitioner, and Action Research Knowledge* (Sage Benchmarks in Social Research Series). Sage.
- Darder, A. (2017). *Reinventing Paulo Freire: A pedagogy of love*. Routledge.
- Denzin, N. K. (2012, 2012/04/01). Triangulation 2.0. *Journal of Mixed Methods Research*, 6(2), 80-88. <https://doi.org/10.1177/1558689812437186>
- Dewey, J. (1933, 06/19/). How We Think [Book Review]. *Journal of Education*, 116(12), 321-321.
- Dorman, E. H. (2020, 09//). A CYCLE OF FRAGILITY: Prospective Teachers' Emotions and Perspectives Around Being Assessed and Evaluated [Article]. *Curriculum & Teaching Dialogue*, 22(1/2), 265-279.
- Efron, S. E., & Ravid, R. (2019). *Action research in education: A practical guide*. Guilford Publications.
- Eutsler, L., & Curcio, R. (2019). Private blog reflections connecting course content with field experiences: preservice teachers grapple with teacher identity. *Reflective Practice*, 20(2), 250-265.
- Fitt, H. (2018). Researching mobile practices: Participant reflection and audio-recording in Repeat Question Diaries. *Qualitative Research*, 18(6), 654-670.
- Flores, J., & Alfaro, A. R. (2022, 2022/05/27). Critical pedagogy: Loving and caring within and beyond the classroom. *Curriculum inquiry*, 52(3), 385-396. <https://doi.org/10.1080/03626784.2022.2072665>
- Foong, L., Nor, M. B. M., & Nolan, A. (2018, 03//). Individual and collective reflection: Deepening early childhood pre-service teachers' reflective thinking during practicum [Article]. *Australasian Journal of Early Childhood*, 43(1), 43-51. <https://doi.org/10.23965/AJEC.43.1.05>
- Freebody, P., & Freiberg, J. (2006). Cultural Science and qualitative educational research: Work 'in the first place' on the morality of classroom life. *International Journal of Qualitative Studies in Education*, 19(6), 709-722. <https://doi.org/https://doi.org/10.1080/09518390600975909>
- Gilbourne, D. (1999). Collaboration and reflection: adopting action research themes and processes to promote adherence to changing practice. *Adherence issues in sport and exercise*, 239-262.
- Gray, C., Wright, P., & Pascoe, R. (2017). There's a lot to learn about being a drama teacher: Pre-service drama teachers' experience of stress and vulnerability during an extended practicum. *Teaching and Teacher Education*, 67, 270-277. <https://doi.org/10.1016/j.tate.2017.06.015>
- Hunuk, D., & MacPhail, A. (2022). Exploring the co-construction of an action research experience between a teacher educator and pre-service teachers. *European Physical Education Review*, 1356336X221126377. <https://doi.org/10.1177/1356336X221126377>
- Kemmis. (1988). Action Research. In J. P. Keeves (Ed.), *Educational Research, Methodology, and Measurement: An International Handbook* (pp. 42-49). Pergamon Press.
- Khanjani, A., Vahdany, F., & Jafarigohar, M. (2018). Effects of journal writing on

- EFL teacher trainees' reflective practice. *Research in English Language Pedagogy (RELP)*, 6(1), 56.
- Klemola, U., Heikinaro-Johansson, P., & O'Sullivan, M. (2013). Physical education student teachers' perceptions of applying knowledge and skills about emotional understanding studied in PETE in a one-year teaching practicum. *Physical Education and Sport Pedagogy*, 18(1), 28-41.
- Luguetti, C., Kirk, D., & Oliver, K. L. (2019, 2019/11/02). Towards a pedagogy of love: exploring pre-service teachers' and youth's experiences of an activist sport pedagogical model. *Physical Education and Sport Pedagogy*, 24(6), 629-646. <https://doi.org/10.1080/17408989.2019.1663499>
- Marathe, A., & Sen, A. (2021, 2021/07/04). Empathetic reflection: reflecting with emotion. *Reflective Practice*, 22(4), 566-574. <https://doi.org/10.1080/14623943.2021.1927693>
- Mesquita, Coutinho, De Martin-Silva, L., Parente, B., Faria, M., & Afonso, J. (2015). The value of indirect teaching strategies in enhancing student-coaches' learning engagement. *Journal of Sports Science & Medicine*, 14(3), 657.
- Moen, K. M., Westlie, K., Gerdin, G., Smith, W., Linnér, S., Philpot, R., Schenker, K., & Larsson, L. (2020). Caring teaching and the complexity of building good relationships as pedagogies for social justice in health and physical education. *Sport, Education and Society*, 25(9), 1015-1028.
- Moffatt, A., Barton, G., & Ryan, M. (2016, 2016/11/01). Multimodal reflection for creative facilitators: an approach to improving self-care. *Reflective Practice*, 17(6), 762-778. <https://doi.org/10.1080/14623943.2016.1220935>
- Moussaid, R., & Zerhouni, B. (2017). Problems of pre-service teachers during the practicum: An analysis of written reflections and mentor feedback. *Arab World English Journal (AWEJ) Volume*, 8.
- Noddings, N. (2012, 2012/12/01). The caring relation in teaching. *Oxford Review of Education*, 38(6), 771-781. <https://doi.org/10.1080/03054985.2012.745047>
- Nowell, Norris, White, & Moules. (2017). Thematic analysis: Striving to meet the trustworthiness criteria. *International journal of qualitative methods*, 16(1), 1609406917733847.
- Öhman, M., & Quennerstedt, M. (2012). Observational studies: Marie Öhman and Mikael Quennerstedt. In *Research Methods in Physical Education and Youth Sport* (pp. 192-206). Routledge.
- Ostedgaard, M. (2022). *Principals' Perspectives of Trust and Vulnerability in Leadership: A Grounded Theory Study* University of Denver].
- Østergaard, L. D. (2019). Creation of new routines in physical education: second-order reflection as a tradition-challenging form of reflection stimulated by inquiry-based learning. *Sport, Education and Society*, 24(9), 981-993.
- Patton, M. Q. (2015). Qualitative research & evaluation methods: Integrating theory and practice.
- Pavlovich, K. (2007, 2007/09/01). The development of reflective practice through student journals. *Higher Education Research & Development*, 26(3), 281-295. <https://doi.org/10.1080/07294360701494302>
- Roulston, K., & Choi, M. (2018). Qualitative interviews. *The SAGE handbook of*

- qualitative data collection*, 233-249.
- Schön, D. A. (1987). *Educating the reflective practitioner*. Jossey-Bass.
<https://psycnet.apa.org/record/1987-97655-000>
- Schwind, J. K., & Manankil-Rankin, L. (2020). Using narrative reflective process to augment personal and aesthetic ways of knowing to support holistic person-centred relational practice. *Reflective Practice*, 21(4), 473-483.
- Simel Pranjić, S. (2021). DEVELOPMENT OF A CARING TEACHER-STUDENT RELATIONSHIP IN HIGHER EDUCATION [Article]. *Journal of Education, Culture & Society*, 12(1), 151-163.
<https://doi.org/10.15503/jecs2021.1.151.163>
- Slepcevic-Zach, P., & Stock, M. (2018). ePortfolio as a tool for reflection and self-reflection. *Reflective Practice*, 19(3), 291-307.
- Tsangaridou, & Polemitou. (2015). Exploring pre-service classroom teachers' reflections on teaching physical education. *European Physical Education Review*, 21(1), 66-82.
- Ugalingan, G. B., Bautista, A. C., & Mante-Estacio, M. J. (2022, 04//). Pre-service teachers' reflection on their efficacy beliefs in conducting action research [Article]. *Reflective Practice*, 23(2), 266-278.
<https://doi.org/10.1080/14623943.2021.2014312>
- Walker, C., & Gleaves, A. (2016, 2016/02/01/). Constructing the caring higher education teacher: A theoretical framework. *Teaching and Teacher Education*, 54, 65-76.
<https://doi.org/https://doi.org/10.1016/j.tate.2015.11.013>

Empirical Article 3

How can tailored questions foster reflection in pre-service teachers? A year-long action research study?

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Abstract

This year-long action research (AR) study, conducted in the context of a physical education teacher education (PETE) program in Portugal, explored how critical reflection among pre-service teachers (PSTs) developed in response to tailored questioning by an external facilitator (EF). Participants were six PSTs and the first author, who assumed the dual role of EF and researcher. Four AR cycles, each involving a self-reflection analysis, intervention, and the development of the PSTs' reflections were completed. During each AR cycle, the EF examined the PSTs' teaching-learning practices and views and generated tailored questions to support critical reflection. Data were collected through focus group interviews and written reflection journals. The EF also made participant observations to contextualize each PST's teaching-learning process, resulting in field notes. Using various question types (e.g. leading, probing, and procedural next-step questions) designed to address individual needs, PSTs progressed from a basic reflection level to thinking critically about their teaching-learning practices. The questions were helpful for PSTs in interpreting daily issues faced in teaching-learning and understanding the relevance of self-analysis and attention to learners' needs in fostering critical reflection. Given these results, we recommend that PETE programs incorporate a component or module explicitly promoting reflection on and analysis of PSTs' pedagogical practices.

Keywords: Reflective practice, reflection skills, initial teacher education, questioning

Introduction

The ability to reflect has been widely emphasized as being paramount in the process of becoming a teacher (Østergaard, 2019). In the training of pre-service teachers (PSTs), the practicum¹³ plays a central role in honing their ability to reflect (Pereira et al., 2023). Through the practicum, PSTs can address real-world

¹³ The practicum is a supervised learning environment where students learn through active participation in real-world experiential teaching activities under close guidance (Schön, 1987).

challenges within the classroom by engaging in reflective analysis of their teaching-learning practices (Murphy et al., 2021; Nelson et al., 2016). Specifically, by using self-questioning procedures, PSTs can gain a deeper understanding and interpretation of the complexities, diversity, and unpredictability inherent in physical education (PE) (Tur et al., 2016).

Described as a process of meaning-making, reflection allows PSTs to intentionally refine and adapt their teaching-learning practice, such as by applying different pedagogical approaches. This stimulates the development of what Schön (1987) termed 'knowledge in action'. The ability to reflect can manifest at various levels (Van Manen, 1977), including the technical level (factual and descriptive), practical level (considering multiple perspectives without evaluating experiences), and critical level (analyzing social structures and aiming for valuable and fair educational outcomes). Prior research in physical education teacher education (PETE) programs has shown that PSTs often focus on describing classroom practices (Standal and Moe, 2013; Zhu, 2011) and tend to replicate established ideas (Greve et al., 2021). Therefore, despite its recognized importance in fostering deep thinking through self-questioning, contextual analysis, and consideration of others in the teaching-learning practice, critical reflection has been challenging to develop among PSTs (Azevedo et al., 2022).

Critical reflection is an ongoing process of self-analysis, questioning, and challenging of assumptions about teaching-learning (Liu, 2015). It allows PSTs to gradually scrutinize their teaching-learning practices (Keay, 2006) and evolve as *reflective practitioners*, continually generating multiple action possibilities that enrich their pedagogical approaches (Larrivee, 2008). Through critical reflection, PSTs can engage deeply with their world, delving into their inner selves (Liu, 2015). Simultaneously, PSTs gain insight into how personal experiences influence their teaching-learning practices (Williams, 2020). One crucial step in developing critical reflection among PSTs is learning to question their teaching decisions (Turan and Koç, 2019). However, the development of critical reflection among PSTs has often been overlooked in PETE contexts because of the

traditional use of the dualist approach¹⁴ (Azevedo et al., 2022).

Questioning strategies are essential for nurturing critical reflection and attributing meaning to the practical experience of becoming a teacher (Tsangaridou and Polemitou, 2015). When prompted by context-specific and tailored questions, the development of critical reflection enables PSTs to move from a dualistic approach (i.e. right vs. wrong solutions) to a relativist approach (i.e. considering multiple solutions). This expansion of perspective encompasses thinking, interpretation, and pedagogical action (Brookfield, 1987; Sheridan and Mungai, 2021). Therefore, the presence of an external facilitator (EF) is crucial for guiding and supporting individuals through this process. An EF can lead the questioning process, and adapt question types so that they meet the needs of PSTs and align with their level of reflection and teaching-learning context (Connolly et al., 2020). Doing so, this approach replaces the reproductive one-size-fits-all method with innovative perspectives that stimulate the ability to engage in critical reflection on teaching-learning practice (Foong et al., 2018; Mesquita et al., 2023).

To date, few empirical studies have considered how in-depth questioning can enhance the reflective abilities of PSTs. Madin and Swanto (2019) conducted a three-semester action research (AR) study aiming to develop PSTs' reflections. However, they employed a structured checklist for their questioning prompts, limiting their adaptability. More recently, Jung et al. (2022) investigated the impact of three types of question prompts (standards-based, concept-based, and task-based) over 16 weeks on the development of PSTs' reflection, although similarly their standardization of questions constrained the open exploration of the PSTs' reflections. Furthermore, there is a dearth of qualitative and empirical research exploring how an EF influences the development of PSTs' reflection through ongoing tailoring of different questions. The AR design, with its intentional, interactive, cyclical, contextual and interventionist nature (Lewin, 1946) could provide a comprehensive platform for monitoring and exploring PSTs' needs and challenges throughout their practicum. As suggested by Carr and Kemmis (1986),

¹⁴ In the dualistic approach, knowledge is seen as known and absolute facts, representing a dichotomous perspective of the world, such as good or bad, right or wrong (Perry, 1999)

and more recently by Marshall et al. (2022), the integration of an EF is crucial for scaffolding the development of PSTs' reflection.

Accordingly, employing a yearlong AR design within the context of PETE, this study focuses on the development of critical reflection among PSTs. The study specifically examines this development in response to tailored questions posed by an EF.

The reflection process: levels of development and question types

To gain a comprehensive understanding of, explore, and encourage reflective practice among PSTs, this study considers the categorizations of various authors to construct a theoretical framework to guide the actions of the EF.

Levels of reflection

Several authors have explored levels of reflection, enhancing current understanding of its complexity as a process and offering complementary approaches to facilitate a more comprehensive approach to reflective practice.

Van Manen (1977) proposed a categorization of reflection with distinct levels, where *technical reflection* focuses on optimizing teaching-learning methods, while *practical reflection* involves considering multiple perspectives without evaluation of experiences. In contrast, *critical reflection* extends further, involving an analysis of social structures and aiming for valuable and equitable educational outcomes.

Zeichner and Liston (1985) proposed a different approach, distinguishing between various types of reflective discourse within the educational context. *Factual reflection* pertains to specific events in teaching-learning, while *prudential reflection* involves suggestions and assessments of actions in the educational environment. *Justificatory reflection* delves into classroom practices and decision-making, considering social influences. Lastly, *critical reflection* emphasizes the importance of acknowledging multiple perspectives when explaining actions in the educational context.

Related to these perspectives, Tsangaridou and Siedentop (1995) introduced the 'Reflective Framework for Teaching in Physical Education,' which

describes different foci and levels of reflection for PE teachers. This framework delineates three main types of reflection: i) *Technical reflection*, which centers on instructional and managerial aspects; ii) *Situational reflection*, addressing specific contextual issues; and iii) *Sensitizing reflection*, encompassing considerations of social, moral, ethical, or political factors. Furthermore, the framework identifies three levels of reflection: i) *Description*, which involves providing information about a situation; ii) *Justification*, which entails presenting logical reasoning to support decisions; and iii) *Critique*, which includes evaluations of teaching actions, considering their implications and potential improvements.

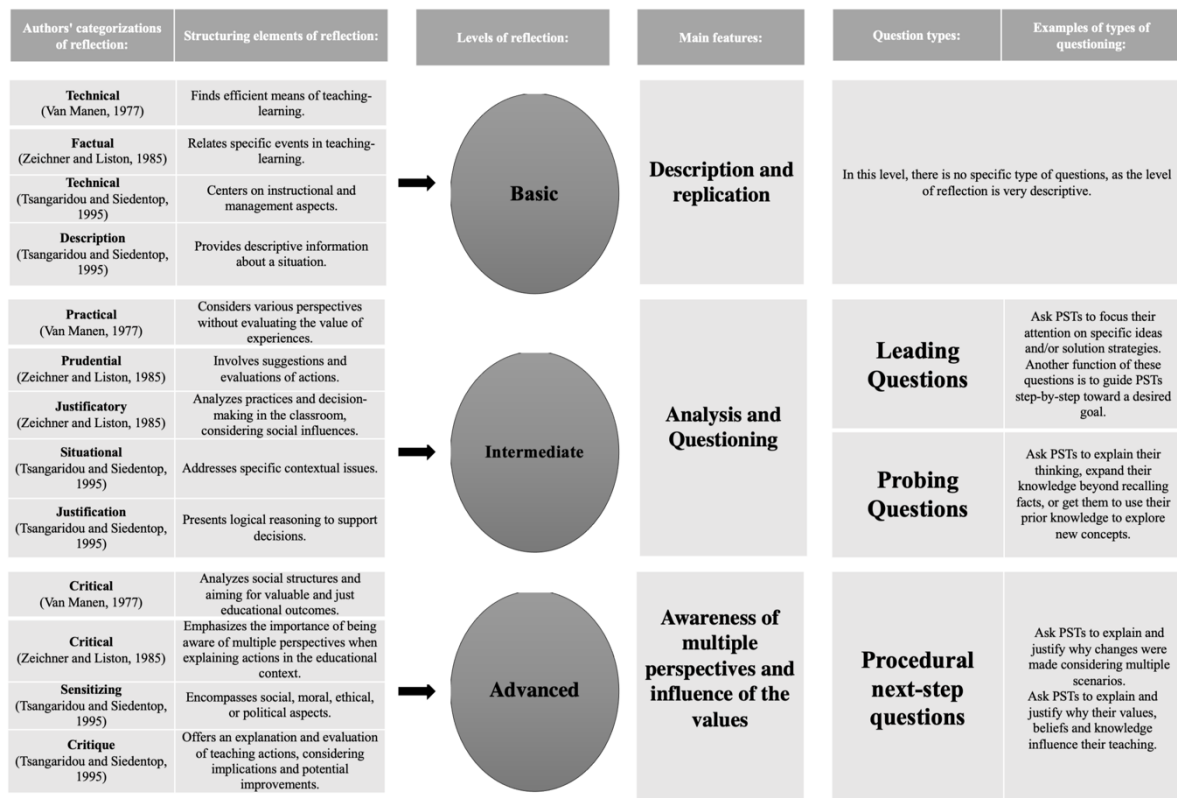
Despite variations in terminology, there is a consensus that deepening reflection is essential for achieving a critical examination of educational interventions. To this end, we synthesized elements from various models proposed by different authors and organized them into *basic*, *intermediate*, and *advanced* levels of reflection. Proficiency at the advanced level equips PSTs with the skills required for critical reflection. Our approach aims to encompass a broad range of elements, thereby enhancing the comprehension of the nuanced levels of reflection. This can assist EFs in identifying and supporting the development of individual PSTs' reflective capabilities. Figure 1 illustrates the integration of these different categorizations of reflection and their relationship to the types/levels of questions.

Question types

We also integrated the approaches of several authors who have employed diverse question types to stimulate critical thinking in PSTs by encouraging them to reflect on their roles, perspectives, and assumptions (Paoletti et al., 2018; Sahin and Kulm, 2008). For example, *leading questions* direct PSTs' attention toward specific ideas and/or solution strategies, or guide them step-by-step toward a desired goal; *probing questions* prompt PSTs to explain their thought processes, expand their knowledge beyond factual recall, or use their prior knowledge to explore new concepts; and *procedural next-step questions* motivate PSTs to elucidate and justify the reasons for making changes, considering various scenarios and allowing their values influence their teaching-

learning practice. While each question type targets different levels of reflection, they can be flexibly applied as needed, depending on the specific requirements of PSTs. Guided by the established framework, levels of reflection and question types, the subsequent section delineates the methodology employed to show the operationalization of these theoretical constructs.

Figure 1. Illustration of the integration of various levels of reflection and the relationship between types of questions and levels of reflection.



Method

Study design

In practical AR, researchers work closely with practitioners to identify problems, devise strategic action plans, monitor changes, and reflect on outcomes (Carr and Kemmis, 1986). This type of research concentrates on the 'how to do' aspect (Elliott, 1991), helping participants gain deeper insights into and enhance their practices. We selected practical AR due to its potential to promote improvement in practice by leveraging the wisdom of PSTs (Grundy, 1988). This approach allowed the EF to understand the practice-related issues of PSTs and offer

personalized support by using tailored questions. To implement this approach, the EF implemented four spiraling self-reflection cycles (i.e. plan, act, evaluate, reflect), guided by the reflexive, collaborative, and interventionist nature of AR (Cooke & Wolfram Cox, 2005).

A preliminary exploratory phase was included at the beginning of the first AR cycle to gauge the level of reflection among PSTs. This facilitated a more informed understanding of the types of questions that should be asked in subsequent interventions (Gilbourne, 1999). In the second AR cycle, the EF recognized the importance of using leading questions to prompt PSTs' reflections. In the third AR, probing questions played a vital role in encouraging the PSTs to question and justify their practice-related issues. In the fourth AR cycle, the EF used next-step procedural questions to help PSTs consider multiple perspectives, and the role of the self, in their critical reflection. Each cycle, lasting approximately one and a half months, was carefully analyzed by the authors to address critical issues.

Context and participants

The study comprised six PSTs who were in the second year (i.e. practicum) of their PETE program in Portugal. The practicum was supervised by a cooperating teacher (CT) from the host school and a supervisor from the faculty. These PSTs were selected using purposive and convenience sampling criteria (Sarstedt et al., 2018) considering factors such as availability and willingness to participate. The EF holds a master's degree in PE and is a researcher specializing in this field. All participants were informed about the research scope and their right to withdraw from the study at any time. Consent forms were signed, and participant anonymity was ensured by using pseudonyms. The study adhered to the guidelines outlined in the Declaration of Helsinki and was approved by the Research Ethics Committee at the first author's institution.

Participant engagement

Throughout the AR process, the first author assumed the dual role of EF and researcher to support and improve the practices of PSTs while also ensuring that

their voices, experiences, and opinions were acknowledged (Nehez, 2022). The selection of the EF was motivated by their potential to foster meaningful discussions among PSTs about their reflections, to formulate questions, and to observe PST practices (Peralta et al., 2021). Research supports the use of EFs to provide personalized perspectives on the adoption of pedagogical innovations. These perspectives require deep reflection to challenge existing practices and enhance the inquiry process (Goodyear and Casey, 2015).

The PSTs actively participated in the AR process, sharing their thoughts and concerns while also fulfilling their teaching-learning roles. As the PSTs' reflections progressed, the EF aimed to deepen understanding by encouraging them to interpret and identify the challenges they encountered in practicum (Grundy, 1988). Notably, the identification of problems and focus on enhancing the level of reflection among PSTs were guided by the specific characteristics of the group (e.g. current reflection levels, motivations, issues arising from their practicum).

Data collection

Multiple data sources were used within each AR cycle to enhance the understanding of how the EF tailored the questions. Data collection followed an intentional sequential logic, comprising four focus groups (FG) (one per AR cycle), 24 participant observations (PO) (four per PST), and 24 reflective journals (RJ) written by the PSTs (four per PST). The EF analyzed the perspectives of the PSTs, starting with their insights expressed in the FGs, and subsequently exploring the practical application of these insights through the POs and RJs.

The FG sessions were semi-structured (Patton, 2014). Before each FG session, a list of questions/topics for discussion was prepared, including questions like: 'Given that challenge, what do you think is the first step to overcoming it? What else were you able to identify? Why do you persist in that approach? Can you explain it?' New themes emerging during the dialogues related to the topic were also explored (Freebody and Freiberg, 2006). All FGs were conducted by the EF and were audio-recorded for later transcription. The interviews served a dual purpose: (i) to explore and understand the thoughts and

concerns of the PSTs concerning their own practical experiences, and (ii) to question the ideas of the PSTs based on their level of reflection in each AR cycle (Patton, 2014).

Additionally, the EF conducted the POs during the PSTs' practicum by taking field notes. These notes extended beyond documenting the tasks and pedagogical actions performed by the PSTs, including observations of real-time decisions and adaptations made by the PSTs. This helped the EF grasp how the PSTs' thoughts were being put into practice and identify any practice-related issues that might not have been verbalized (Öhman and Quennerstedt, 2012). This information allowed for the identification of relevant situations that informed the design of questions for contextualized discussions during the subsequent FG session. Finally, the RJs were written by the PSTs after their teaching sessions and referred to the ideas that EF had questioned the week before (e.g. 'What ideas from last week's discussion with the EF did you try to implement in this week's teaching?' 'How did your plans change in real-time, and why?'). The RJs enabled the PSTs to gain a better understanding of their thoughts and organize them more effectively. They also provided multiple opportunities for reflection on non-verbalized thoughts that could influence their teaching experiences (MacPhail and Sohun, 2019). The RJs played a critical role in formulating questions for the upcoming FG sessions alongside the PO notes.

Each data source offered distinct insights that enabled the EF to choose the most suitable questions to address PSTs' challenges at each level of reflection.

Data analysis

Data collection and analysis were closely interconnected given the situated, cyclical, and interactive nature of the practical AR design. Thematic analysis was chosen because it enabled the researcher to identify, analyze, and report patterns (or themes) within an extensive dataset (Nowell et al., 2017). A deductive evaluation was deemed necessary as we employed a specific framework to guide both the research process and data analysis. To ensure linguistic accuracy, the data underwent a rigorous translation process from Portuguese to English involving two bilingual translators who were familiar with the research (Brislin,

1970).

We followed the six stages of thematic analysis outlined by Braun and Clarke (2019). First, the researchers immersed themselves in and familiarized themselves with the entire dataset. Second, initial coding was generated from the data obtained in the FGs, RJs, and PO notes. This coding was examined line by line to identify key categories. During this stage, focused coding was used to group text units with similar meanings (i.e. subthemes) into single categories (i.e. themes). Written notes were added to help the authors interpret the PSTs' reflections. This analysis became more nuanced at the end of each AR cycle, thanks to reflections that were informed by the triangulation of data from multiple sources (i.e. FG, RJ, and PO).

In the initial AR cycle, the subthemes 'Adherence to Planning,' 'Planning as a Mechanism for Problem-Solving,' and 'Planning as the Singular Important Instrument in Teaching' were grouped into the overarching theme of 'Planning'. In the subsequent cycle, the subthemes reflected the PSTs' 'breaking free from a planning-centric view', 'turning their attention to student performance', and 'engaging in self-questioning', thereby building the theme 'Interpretation of Ongoing Events'. During the third cycle, subthemes revealed that 'PSTs started to adapt their teaching to students' behavior and motor performance', indicating the overall theme of 'development of multiple perspectives'. Finally, in the fourth cycle, PSTs 'began to place themselves at the center of their analyses' by 'incorporating their own characteristics into the interpretation of actions', 'adapting their actions based on these characteristics', and 'gaining an understanding of how their individual traits influence their teaching'.

The third stage of analysis encompassed theoretical coding, involving the linkage of existing datasets to the concept of 'reflection levels' and an interactive process of moving between data and theory. We used elements associated with different levels of reflection and the challenges faced by PSTs in their practice to identify, clarify, and reflect upon the data. For example, we considered aspects of 'reflection as description' and 'reflection as questioning'. In the fourth stage, we conducted a comparison of our independently coded and themed data to define and label themes based on common elements. When we compared our codes

and themes, we identified 'levels of reflection' and 'challenges in reflection' as common and dominant themes. The fifth stage involved organizing the levels of reflection, enhancing the analysis of the PSTs' reflections, and interpreting the data by incorporating the theoretical frameworks that were identified from the basic, intermediate, and advanced levels of reflection, along with the various types of questions. The sixth stage involved writing the report, analyzing the fully developed themes, and presenting a concise, coherent, and logically structured account of the data.

Trustworthiness

An AR study must address the issues of subjectivity and trustworthiness in data interpretation (Coghland, 2019). Accordingly, we adopted a qualitative approach within an interpretative paradigm (Guba and Lincoln, 1994). Furthermore, the study adhered to ontological relativism and epistemological constructionism (Weed, 2009). This perspective acknowledges the existence of multiple subjective realities and emphasizes that knowledge is constructed through individual-environment interactions. Therefore, the EF adopted a reflective and receptive approach. In this context, understanding the perceptions of PSTs was considered a critical component of our practical AR.

To minimize individual researcher subjectivity (Nowell et al., 2017) and enhance research quality we employed four key strategies: (1) data triangulation involving FGs, field notes (i.e. as a product of the POs) and RJs, all of which were further analyzed to incorporate a wide range of perspectives at the end of each AR cycle; (2) continuous stakeholder data analysis by engaging in regular peer debriefings between the first author and co-authors; (3) questioning PSTs about the implicit meaning of their reports; and (4) acknowledging disciplined subjectivity involves the researcher being cognizant of their own perspectives and transparent about the potential influence these perspectives may have on the study (Efron and Ravid, 2019).

Results

First AR cycle – 'I did what I planned to do.'

At the outset of the practicum, PSTs' self-analysis of their teaching practices was restricted to procedural knowledge, specifically focusing on aspects such as integrating learning content and classroom management. In the first FG session, PSTs indicated that their reflections were focused on planning the lessons based on a description of the learning content (i.e. basic level): 'Yes, because the plan contains everything I need for the class, like the timeframes, the transitions, the instruction, what I need to work with them, the learning tasks... basically it holds all the elements that I need to focus on during class' (Sara, FG1). In their RJs, PSTs described how they organized each learning task: 'when I started explaining the learning tasks, I stood in front of the class, then I made sure that the students were in a semicircle' (António, RJ1). Aligning with the ideas expressed in the FG discussions, PSTs highlighted their dependence on the lesson plans in their RJs, especially when they believed that the plan would serve as a safeguard against making errors: 'I planned everything with the necessary time so nothing would go wrong' (Gustavo, RJ1).

Moreover, PSTs believed they should follow the plan rigorously, applying the learning content regardless of any disruptions. This conviction was evident in Maria's statement: 'Do you need the plan during class? For what? Maria: Without it, if something wrong might happen, and I could freeze (...) if the plan is correct, all I have to do is follow it. Since I know it's properly conceived, the rest doesn't matter. I just apply it and move forward' (Maria, FG1). Thus, PSTs held the view that the closer they adhered to the lesson plan, the more effectively they could implement it: 'I considered the number of students for each learning task (...) the activity times seemed suitable (...) as such I consider all the aspects included in the class plan were fulfilled' (Maria, FG1).

At the end of the first AR cycle, the EF observed from the POs that PSTs focused on the number of students present when analyzing their learning tasks: 'What should I do now? Two students are missing class, so they aren't doing what I requested' (Paulo, PO1). At the end of this cycle, it became clear that their perception of success in teaching remained tied to the notion of memorization: 'I should have memorized the plan better in this part' (Gustavo, PO1).

Second AR cycle – the start of self-reflection – ‘What is happening here?’

After the first AR cycle, the EF observed from the POs that PSTs had made changes to the learning tasks outlined in the lesson plan: ‘Maria modified the learning task variable and, curiously, that variable wasn’t part of the class plan’ (Maria, PO1). This change led the EF to analyze the change in the PSTs’ level of reflection, which had previously been limited to procedural knowledge. In this phase, the EF used simple direct questions (i.e. leading questions): ‘What made you change the planned content? Please explain to me what led you to make this decision?’ (EF, FG2).

The PSTs subsequently clarified that these changes were a response to instructions given by the CT: ‘I changed it because the CT told me to do it. When he gives me instructions, I must follow them’ (Maria, FG2). Notably, whenever the CT recommended alterations during class, the PSTs would accept and implement them un-questioningly. This suggests that the PSTs were thinking reproductively: ‘At this moment if he [CT] didn’t intervene in class, I would find myself in a complicated situation. I need him sometimes (...), so I do not feel lost’ (Maria, FG2).

In addition to their inclination to adhere to the lesson plan, the PSTs also showed a reliance on the CT’s suggestions. To address this, the EF posed leading questions to encourage the PSTs to engage in a more analytical assessment of their practices, with a focus on creating solutions to the identified problems: ‘So what are other elements you should consider while thinking about teaching?’ (EF, FG2). The EF also encouraged discussion by using leading questions to prompt the PSTs to consider additional classroom elements: ‘What other things worry you before class? What else were you able to identify?’ (EF, FG2).

The use of leading questions prompted the PSTs to observe what was happening in their lessons (i.e. intermediate reflection). However, their cognitive focus was on metacognitive monitoring, particularly in terms of evaluating the criteria for the execution of students’ motor skills: ‘I was observing a student that usually has a good serve, and in that particular lesson, he was acting weird, and the serve kept coming out wrong. That drove me to think about the class: what’s

going on there?’ (Paulo, FG2). This was further evident during the POs, where PSTs expressed particular concern about correcting students’ motor performance: ‘I was always giving feedback about the students’ head positions. Whether they had raised their heads or whether they remained in the same place’ (Gustavo, PO2).

To challenge the task-oriented analysis exhibited by the PSTs and promote further reflective development, the EF asked probing questions during the FG sessions. The EF aimed to motivate the PSTs to analyze their teaching practices and question ‘what’, ‘how’, and ‘why’ they behaved in certain ways during their practice. Hence, the EF posed questions that encouraged the PSTs to articulate their thoughts beyond merely recalling facts (i.e. probing questions) ‘Why do you persist in that approach? Can you explain it?’ (EF, FG2).

As a result, the PSTs began to incorporate both the ‘how’ and the ‘what’ aspects into their pedagogical interventions. However, they encountered challenges when it came to providing comprehensive explanations, placing them within the category of intermediate reflection. For example, one PST expressed: ‘But it’s hard to solve it because they’ve learned this habit over the years’ (António, FG2). Additionally, the EF noted: ‘nervousness and restlessness at the end of the class was evident, he said he was confused because he couldn’t make the right decisions for each problem’ (Gustavo, PO2).

At the end of this AR cycle, the PSTs had progressed from merely analyzing what was happening in class to posing questions to themselves (i.e. intermediate reflection).

Third AR cycle – considering different possibilities – ‘What can better help me understand what is going on?’

In the second AR cycle, the PSTs could not support their answers to the questions integrated into their reflections (i.e. intermediate reflection). Consequently, the EF used probing questions to help the PSTs develop the ability to explain and justify how their questioning strategies influenced their pedagogical interventions: ‘Are you able to explain your thinking process when you are teaching them? What kind of questions do you ask them?’ (EF, FG3).

In response, the PSTs demonstrated that questioning had enabled them to adjust their teaching strategies more effectively to their class characteristics. The PSTs questioned their teaching practices while integrating their knowledge from prior curricular units and their understanding of the classroom context (i.e. intermediate reflection): 'Now I'm teaching a class, and I think, okay, I've learned to demonstrate the learning task this way, but now I wonder if it is the best way to do it for this class or not' (Gustavo, FG3). The PSTs' reflections still tended to be limited, as they did not always explore alternative possibilities beyond those they had considered: 'these problems are specific to this class, my colleague, for instance, has others (...) logically, devising a strategy depends only on me' (Sara, FG3). To facilitate reflection among the PSTs and encourage them to consider multiple courses of action, the EF posed questions that required them to explain how shifts in their thinking influenced their teaching practices (i.e. procedural next-step questions): 'Can you identify different aspects now? How does that change improve your teaching?' (EF, FG3).

Consequently, the PSTs began to differentiate various aspects of their teaching practice, particularly their understanding of students' individuality and their ability to adapt their actions based on student characteristics (i.e. intermediate reflection): 'I began to anticipate how they would react (...), I realized, that I would be rougher with the boys' group and softer with the girls' group' (Maria, FG3). Based on their analysis, the PSTs' revealed their ability to adapt whenever workgroups and tasks were changed: 'Did you change anything?' (EF, FG3). 'Yes, I did. I realized that some boys didn't like when I talked like that with them, so I started calling them apart, and I also started grouping the calmer students' (Maria, FG3).

In their written reflections, PSTs acknowledged that their actions should encompass more aspects: 'to consider the whole and not just the sum of all parts, I mean, my equation has to include me, the students, the weather conditions, and other factors beyond my control' (Gustavo, RJ3). During the PO, it became evident that PSTs were engaging in an intermediate-level reflection of their teaching. They demonstrated the ability to use various strategies based on the specific needs of their students: 'Presents a relaxed and fun posture with the

eldest student group (...) she adapts the instruction according to the situation and promotes greater student understanding' (Maria, PO3).

By the end of this AR cycle, PSTs had started to consider various factors that influence the teaching-learning process, which in turn would impact their teaching (e.g. class characteristics, students' needs) and reflections (i.e. intermediate reflection). However, they had not fully grasped the comprehension of social contexts, and some PSTs continued to find self-questioning challenging. For example, one PST expressed his confusion: 'I'm still a bit confused. I thought the key was being certain about our teaching' (Paulo, FG3).

Fourth AR cycle – the influence of the self in PSTs' practice – 'Does it influence my teaching?'

Given the difficulty that some PSTs had in placing themselves in the reflective process, the EF resorted to procedural next-step questions. Through these questions, the EF aimed to analyze the PSTs' behavior when facing various situations during their lessons: 'I noticed you changed how you explained, but should you always do that? What if the student answers adequately? (...) What about other ages? In which situations is that applicable, and how could you do it?' (EF, FG4). These questions encouraged the PSTs to consider their impact on student learning outcomes in different scenarios: 'That includes us in class, how we teach it, like when I teach it or when Sara teaches it. It is different, right?' (Gustavo, FG4), which revealed a more advanced level of reflection.

By using procedural next-step questions, the EF sought to evaluate the impact of both the PSTs and their students on teaching. This was done by asking about the practical implementation of this concept: 'So how do you avoid misbehavior? Give me specific examples' (EF, FG4). In response, the PSTs demonstrated they were able to contextualize, interpret, and adapt their experiences, taking into consideration the emotions of their students and their own emotional states: 'I do not know yet, I tried to be more aware of our interactions, trying to find who they really are (...) even who I really am' (Sara, FG4). Thus, the EF questioned PSTs to clarify their involvement in formulating solutions to teaching challenges (i.e. procedural-next step questions): 'How did it

change the way you teach, for example, with that tougher group of boys?' (EF, FG4). The PSTs' ability to adapt their behavior in response to emerging challenges during the lesson underscored their skill in assessing the extent of their influence on teaching: 'At first insecurity, but now I calm myself down and even allow them, as a joke, to suggest what's wrong. I make it seem as if it was on purpose to see if they were paying attention' (Maria, FG4).

After the PSTs demonstrated that their reflections took their own influence into account, the EF used procedural next-step questions to determine which personal values were influential. For this, the EF requested a justification for the change in PSTs' decision-making: 'How did you achieve those analyses? Do you ask your colleagues to observe your classes? How does that decision relate to the schools' values and your own?' (EF, FG4). In response, the PSTs began to recognize that the success of their classes depended not only on the characteristics of their students but also on their own attributes, particularly their responsibility for pedagogical interventions (i.e. advanced reflection): 'Now I think that everything depends on us (...) because after watching experienced teachers doing miserable lessons... I realized it was all excuses. In the beginning, it is because we have a lot to do and it's all new, but now I understand we have to work hard for it' (António, FG4).

When the EF encouraged the PSTs to interpret the meaning of their decisions during the lessons and asked questions about the significance of those decisions, some PSTs were prompted to interpret them differently relative to the behavior identified in the first and second AR cycles: 'Honestly, after all, we know nothing about this (...) we are doing it all wrong' (Paulo, FG4). This difficulty was also evident in the PSTs' written reflections, which revealed feelings of instability and disorientation: 'doubt is why I am anguished at this point, not being sure of my decisions, fearing the implications of these uncertainties' (Gustavo, RJ4). However, the PSTs also demonstrated that facing uncertainty in their teaching-learning practice could help them calm down: 'Curiously, António no longer demonstrated nervousness in any moment of teaching, especially with this content he now feels comfortable teaching (...) He was quite hesitant about the need to break down the learning tasks to adjust the difficulty levels for those two

groups' (EF, PO4). Throughout the process, the EF's tailored questions helped the PSTs transition from a reproductive to a multiple view of their thinking, enabling their engagement in advanced-level reflection. Nevertheless, some PSTs still struggled to grasp how their personal characteristics could influence class success: 'It is hard to capture the idea that everything depends on you' (Sara, FG4).

Discussion

This study explored the development of critical reflection in PSTs in response to tailored questions posed by an EF. Adapting the questioning approach to the specific challenges encountered in practice allowed PSTs to progress from a level of reflection that focused on facts, descriptions, and instructional or managerial aspects (i.e. basic reflection) to the ability to interpret their practice critically, in a way that involved being aware of multiple perspectives when explaining their actions (i.e. advanced reflection).

These findings support the work of Jung et al. (2022), which states that standardizing questions can limit the open exploration of PSTs' reflections. The main contribution of this study lies in its ability to leverage PSTs' experiences and the EF's situated intervention and flexible questioning, rather than relying solely on a pre-defined set of questions. This approach was guided by a theoretical framework that informed continuous data analysis, establishing a close connection between the types of questions used and the issues raised by PSTs. By following an intentional, interactive, cyclical, contextual, and interventionist design (Lewin, 1946), this process enabled the EF to provide constant and personalized support. Consequently, the adaptation of questions was based on two key factors: (i) the specific challenges encountered by PSTs and (ii) the evolving reflective abilities exhibited by PSTs over time.

During the first AR cycle, it was evident that PSTs predominantly engaged in basic reflection. This highlighted their initial struggles with the process of reflection and demonstrated the rudimentary level of their reflective practices. Basic reflection was evident by the PSTs providing descriptive information such as 'timeframes, transitions, instruction', with a primary focus on instructional and

managerial aspects like ‘I stood in front of the class’, thus aligning with the framework developed by Tsangaridou and Siedentop (1995). This observation suggests that PSTs often reproduced their planned actions or followed a prescriptive teaching approach. This is consistent with what Dervent (2015) observed in a ten-week AR study in a PE context, where the reflections of PSTs in the early stages primarily centered around planning, time management, and class activities.

Because the PSTs were initially unable to identify and address specific issues in their teaching practice, the EF employed leading questions during the second AR cycle. These questions were designed to help PSTs focus their attention on the specific challenges they encountered, while also directing their attention toward particular concepts (Kabar and Tasdan, 2020). Our findings showed that, as a result of the EF’s leading questions, PSTs began to understand what was occurring in their practice ‘that drove me to think about the class ...what’s going on here?’, marking a transition to an intermediate level of reflection. Nonetheless, PSTs maintaining a dualistic perspective struggled when trying to integrate the questioning.

Consequently, the EF aimed to stimulate critical thinking among PSTs through probing questions. These questions aimed to promote an understanding that there are multiple solutions to every problem. Questions such as ‘Why do you persist in that approach? Can you explain it?’ provoked doubt, leading PSTs to consider other solutions and analyze their practices and decision-making: ‘I’m working out how to solve it’ (i.e. intermediate reflection) (Zeichner and Liston, 1985). These ‘eye-opening’ questions (i.e. what, how, when, why) enabled PSTs to interpret their practice. Aligning with Chan and Lee (2021), who argued providing structure and scaffolding is necessary for fostering learner autonomy, our study demonstrated that tailored questioning within an AR study allowed PSTs to develop their critical thinking. Despite starting to engage in a state of self-critique, our findings suggest that PSTs still struggled to integrate awareness of multiple perspectives. This integration is essential for promoting open-mindedness and nurturing a willingness and commitment to deepen their reflections.

During the third AR cycle, the EF used procedural next-step questions aimed at fostering the PSTs' awareness of multiple perspectives to address this issue. These questions encouraged the PSTs to provide explanations and justifications for their actions (Paoletti et al., 2018). Instead of searching for one correct answer, at this stage, PSTs began to explore various possibilities for action, signifying a transition to advanced reflection. PSTs began to incorporate implications and consider multiple perspectives into their explanations. This included differentiation based on gender, contextualizing their teaching, and taking into account students' emotions, all of which align with our framework. Nevertheless, even at this point, PSTs' reflections still did not integrate the role of the self in their practice.

For this reason, during the fourth AR cycle the EF used procedural next-step questions with an emphasis on addressing the remaining element of advanced reflection: the influence of the self. To help PSTs grapple with this challenge, the EF asked PSTs to explain and justify how their values, beliefs, and knowledge influenced their teaching: 'How did it change the way you teach?' By reiterating these questions, the EF ensured that PSTs expanded their understanding of teaching-learning by incorporating new elements into their thinking. It was noteworthy that after this stage, PSTs began to view their analysis of practice and their actions as integral components of the overall picture, thereby embarking on a journey of critical self-reflection 'trying to find who they really are (...) even who I really am'.

While strides were made in developing critical reflection among the PSTs, progress was uneven within the cohort of participants. Some PSTs continued to grapple with the role of certainty in their pedagogical approach. Similarly, other PSTs found it challenging to grasp how their personal characteristics could influence classroom success: 'It is tough to understand the idea that everything depends on you'. These observations highlight that the journey toward advanced reflective thinking remains challenging for certain PSTs.

Our findings highlight that the EF adapted their questioning to challenge the PSTs' assumptions about teaching-learning practices, aligning them with the PSTs' practical experiences. This approach helped the PSTs to analyze,

interpret, and cultivate a critical perspective on the process. The central contribution of this study lies in its innovative use of questioning within an AR study. Unlike traditional approaches that rely on pre-standardized checklists (Madin and Swanto, 2019), our approach offered flexibility in adapting questions based on the challenges faced by PSTs. This tailored approach not only empowers PSTs to critically analyze and reflect on their experiences but also aids in the discovery of their own voice (Grundy, 1994). Furthermore, it promotes actionable change that includes critical reflection, presenting a dynamic and responsive approach to addressing real-world challenges in PSTs' practicum.

Our findings suggest that questions tailored by an EF to foster critical reflection can be a valuable strategy for promoting PSTs' analysis of multiple perspectives and their awareness of the influence of the self in their teaching-learning practice.

Final thoughts

While critical reflection, as an advanced level of thinking, enables PSTs to become reflective practitioners, all levels of reflection are essential for development. Each level brings different skills that help deepen PSTs' reflective capacity in a dynamic and evolving professional learning. Our work suggests that PETE programs should consider: (i) including questions in their programs to encourage all stakeholders, not just PSTs, to internalize reflection in their practices; (ii) asking appropriate questions related to PSTs' situated experiences as well as PSTs' level of reflection; (iii) promoting mentoring designs that allow for monitoring, evaluation and adaptation of PSTs' questions and critical reflections; and (iv) creating a module that explicitly develops reflection in a structured manner, encouraging PSTs to interpret their practice over time and promoting the exploration of conscious and careful thinking. In this way, supervisors should receive the necessary guidance, support, and training to develop an understanding of reflection. This preparation will enable them to assist PSTs in questioning their teaching-learning practices and better understand students' needs.

As one study limitation, it is important to acknowledge that other factors,

including the ongoing practical pedagogical experiences and coursework related to the PETE program, may also have contributed to developing their critical reflection among the PSTs. This recognition could lead to future research considering the development of modules or units that specifically target and promote critical reflection within PETE programs. By examining the impact of these interventions on the development of critical reflection, researchers can gain insights into the benefits and challenges of integrating reflective practices into teacher education programs.

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References

- Azevedo, Araújo and Mesquita (2022) The development of reflective skills in physical education teacher education: a systematic review. *Retos: new trends on physical education, sport and recreation* 46: 162-178.
- Brislin RW (1970) Back-Translation for Cross-Cultural Research. *Journal of Cross-Cultural Psychology* 1(3): 185-216.
- Brookfield S (1987) Developing Critical Thinkers: Challenging Adults to Explore Alternative Ways of Thinking and Acting. *San Francisco: Jossey-Bass Publishers.*
- Carr W and Kemmis S (1986) *Becoming Critical: education, knowledge, and action research.* Oxon: Routledge.
- Chan CK and Lee KK (2021) Reflection literacy: A multilevel perspective on the challenges of using reflections in higher education through a comprehensive literature review. *Educational Research Review* 32: 100376.
- Coghland D (2019) *Doing an action research in your own organization.* London:

SAGE.

- Connolly SL, Sullivan JL, Ritchie MJ, et al. (2020) External facilitators' perceptions of internal facilitation skills during implementation of collaborative care for mental health teams: a qualitative analysis informed by the i-PARIHS framework. *BMC Health Services Research* 20(1): 165-175.
- Efron SE and Ravid R (2019) *Action research in education: A practical guide*. Guilford Publications.
- Foong LYY, Nor MBM and Nolan A (2018) The influence of practicum supervisors' facilitation styles on student teachers' reflective thinking during collective reflection. *Reflective Practice* 19(2): 225-242.
- Freebody P and Freiberg J (2006) Cultural Science and qualitative educational research: Work 'in the first place' on the morality of classroom life. *International Journal of Qualitative Studies in Education* 19(6): 709-722.
- Gilbourne D (1999) Collaboration and reflection: adopting action research themes and processes to promote adherence to changing practice. *Adherence issues in sport and exercise*. 239-262.
- Goodyear VA and Casey A (2015) Innovation with change: Developing a community of practice to help teachers move beyond the 'honeymoon' of pedagogical renovation. *Physical Education and Sport Pedagogy* 20(2): 186-203.
- Greve S, Weber KE, Brandes B, et al. (2021) What Do They Reflect on? A Mixed-Methods Analysis of Physical Education Preservice Teachers' Written Reflections After a Long-Term Internship. *Journal of Teaching in Physical Education* 41(4): 590-600.
- Grundy S (1994) *Product or curriculum praxis*. Morata Editions.
- Guba EG and Lincoln YS (1994) Competing paradigms in qualitative research. *Handbook of qualitative research* 2(105): 163-194.
- Jung J, Lu Y-H and Ding A-CE (2022) How Do Prompts Shape Preservice Teachers' Reflections? A Case Study in an Online Technology Integration Class. *Journal of Teacher Education* 73(3): 301-313.
- Kabar MGD and Tasdan BT (2020) Examining the Change of Pre-Service Middle School Mathematics Teachers' Questioning Approaches through Clinical Interviews. *Mathematics Teacher Education and Development* 22(1): 115-138.
- Keay J (2006) Collaborative learning in physical education teachers' early-career professional development. *Physical Education and Sport Pedagogy* 11(3): 285-305.
- Larrivee B (2008) Meeting the challenge of preparing reflective practitioners. *The New Educator* 4(2): 87-106.
- Lewin K (1946) Action research and minority problems. *Journal of social issues* 2(4): 34-46.
- Liu K (2015) Critical reflection as a framework for transformative learning in teacher education. *Educational Review* 67(2): 135-157.
- MacPhail A and Sohun R (2019) Interrogating the enactment of a service-learning course in a physical education teacher education program: Less is more? *European Physical Education Review* 25(3): 876-892.
- Madin CV and Swanto S (2019) An inquiry approach to facilitate reflection in

- action research for ESL pre-service teachers. *TEFLIN Journal* 30(1): 1-21.
- Marshall T, Keville S, Cain A, et al. (2022) Facilitating reflection: a review and synthesis of the factors enabling effective facilitation of reflective practice. *Reflective Practice* 23(4): 483-496.
- Mesquita I, Farias C, De Martin Silva L, et al. (2023) How Can Learner-Oriented Scaffolding Strategies Be Implemented in Coach Education? A Case Study. *Research Quarterly for Exercise and Sport* 94(1): 216-225.
- Murphy F, Marron S and Coulter M (2021) Primary field experiences: Critical for primary generalist physical education teachers? *European Physical Education Review* 27(4): 761-778.
- Nehez J (2022) To be, or not to be, that is not the question: External researchers in emancipatory action research. *Educational Action Research* 1(4): 1-16.
- Nelson FL, Miller LR and Yun C (2016) 'It's OK to feel totally confused': reflection without practice by preservice teachers in an introductory education course. *Reflective Practice* 17(5): 648-661.
- Nowell LS, Norris JM, White DE, et al. (2017) Thematic Analysis: Striving to Meet the Trustworthiness Criteria. *International journal of qualitative methods* 16(1): 1-13.
- Öhman M and Quennerstedt M (2012) Observational Studies. *Research Methods in Physical Education and Youth Sport*. Routledge, pp.189-203.
- Østergaard LD (2019) Creation of new routines in physical education: second-order reflection as a tradition-challenging form of reflection stimulated by inquiry-based learning. *Sport, Education and Society* 24(9): 981-993.
- Paoletti T, Krupnik V, Papadopoulos D, et al. (2018) Teacher questioning and invitations to participate in advanced mathematics lectures. *Educational Studies in Mathematics* 98(1): 1-17.
- Patton MQ (2014) *Qualitative research & evaluation methods: Integrating theory and practice*. Sage publications.
- Peralta LR, Bennie A, Gore J, et al. (2021) An Investigation of the Influence of Video Types and External Facilitation on PE Inservice Teachers' Reflections and Their Perceptions of Learning: Findings from the AMPED Cluster Controlled Trial. *Journal of Teacher Education* 72(3): 368-380.
- Pereira ÍSP, Russell T and Riaño XAG (2023) Enhancing student teachers' epistemology of reflective practice while still at the university: Evidence from a sheltered reflective practicum. *Journal of Education for Teaching* 3(2): 1-17.
- Perry Jr WG (1999) *Forms of Intellectual and Ethical Development in the College Years: A Scheme*. Jossey-Bass Higher and Adult Education Series. ERIC.
- Saiz-Linares Á and Susinos-Rada T (2020) Revisiting reflection in pre-service teacher training: let's rethink through a practicum in Spain. *Reflective Practice* 21(5): 629-645.
- Sarstedt M, Bengart P, Shaltoni AM, et al. (2018) The use of sampling methods in advertising research: a gap between theory and practice. *International Journal of Advertising* 37(4): 650-663.
- Schön DA (1987) *Educating the reflective practitioner*. San Francisco, CA: Jossey-Bass.
- Sheridan L and Mungai M (2021) Teacher-student reflections: A critical conversation about values and cultural awareness in community

- development work, and implications for teaching and practice. *Education Sciences* 11(9): 1-12.
- Standal ØF and Moe VF (2013) Reflective practice in physical education and physical education teacher education: A review of the literature since 1995. *Quest* 65(2): 220-240.
- Tsangaridou and Polemitou (2015) Exploring pre-service classroom teachers' reflections on teaching physical education. *European Physical Education Review* 21(1): 66-82.
- Tsangaridou and Siedentop D (1995) Reflective Teaching: A Literature Review. *Quest* 47(2): 212-237.
- Tur G, Marín VI, Moreno J, et al. (2016) From diagrams to self-regulated learning: student teachers' reflections on the construction of their PLE. *Educational Media International* 53(2): 139-152.
- Turan MB and Koç K (2019) The Analysis of the Relationship between Teaching/Learning Conceptions and Reflective Thinking in Physical Education Teacher Candidates. *International Education Studies* 12(3): 116-123.
- Van Manen M (1977) Linking ways of knowing with ways of being practical. *Curriculum inquiry* 6(3): 205-228.
- Williams AT (2020) Growing student teachers' reflective practice: explorations of an approach to video-stimulated reflection. *Reflective Practice* 21(5): 699-711.
- Zeichner KM and Liston D (1985) Varieties of discourse in supervisory conferences. *Teaching and Teacher Education* 1(2): 155-174.
- Zhu (2011) Student teachers' reflection during practicum: Plenty on action, few in action. *Reflective Practice* 12(6): 763-775.

Empirical Article 4

Nurturing the temporal dynamic of reflection among pre-service teachers: the contribution of peer observation and written reflection.

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Abstract

This study aimed to examine how peer observation and written reflection could led Pre-Service Teachers (PSTs) in improving the temporal dynamics of their reflection during the Physical Education practicum. Given its dynamic and collaborative nature, an action-research design was conducted throughout an academic year to explore the ongoing and deliberate adaptation of peer observation and written reflection strategies to develop PSTs' reflection. Six PSTs and the first author, who took on the dual role of external facilitator and researcher, participated in this study. As facilitator, the first author scaffolded the implementation of both pedagogical strategies over the school year. PSTs' reflections were gathered through semi-structured interviews and reflective journal. Also, additional field notes were gathered by the facilitator during participant observation. The findings showed that an intentional structured combination of peer observation and written reflection helped PSTs to develop their ability to reflect-in-action and to reflect on reflection-in-action. The interaction between peer observation and written reflection enabled PSTs to understand the problems derived from their own pedagogical practice, as well as the need to search for new and better solutions. Doing so, PST started to reflect in an action-oriented and critical way. From a practical standpoint, we recommend that Physical Education Teacher Education programs include the development of a temporal dynamic of reflection not only through peer observation and written reflection, but also using multiple strategies (e.g., audio recordings, video analysis, etc.). By nurturing the temporal dynamic of reflection, PSTs can ongoingly re-examine themselves and their pedagogical intervention critically.

Keywords: reflective practice; teacher training; sports pedagogy; action research; physical education; reflection skills.

Introduction

Recognising that learning constructed from practical experiences, the reflective practice is widely recognized as essential to help pre-service teachers (PSTs) becoming aware of their own knowledge (Dewey, 1933b; Mulryan-Kyne, 2021). In this sense, the PSTs consciousness is promoted by dealing with the inevitable dilemmas and trade-offs involved in daily decisions made during practice. Whilst juggling these demands throughout the practicum, PSTs can develop a problematising view of pedagogical intervention and have the opportunity to improve, correct, understand and modify their praxis on the spot (Saiz-Linares & Susinos-Rada, 2020). However, for PSTs deconstruct experiences and capture all the insights of practice, different timings of reflection should take place and be developed during their pedagogical intervention (Miller, 2022). Indeed, PSTs need to develop a complex view of teaching (Davis, 2006), which requires becoming aware of the different perspectives of their own actions, framing their intentionality (Moon, 2013).

By developing the temporal dynamics of reflection, PSTs can increase their quality of reflection because the moment of grasping meaning is a working tool for further insights (Dewey, 1933b). In other words, the *tempus* (i.e., from Latin meaning time) is a tool for understanding other things. Thus, PST can create their own scaffolding process for developing learning (Vygotsky, 1978). From this rational, reflection reveals as an interactive process that can take place at different moments and can be categorized into different manners depending on when it takes place (Dewey, 1933). Cowan (2006), for example, presented 'reflection-for-action', which involves weighing up options in response to impending demands and making appropriate plans. On the other hand, Cowan and Stroud (2016) introduced 'composting reflection', as a re-encounter with an existing collection of past experiences that have already been reflected upon but perhaps never adequately pursued.

Despite the different moments of reflection presented in the scientific literature, the actions that characterise the professional activities of PSTs can be related to the moments of reflection introduced by Schön (1987). For instance, reflection-on-action could help PSTs reflect on their previous analyses (i.e.,

‘reframing’), supporting the adaptations of their teaching plannings. Afterwards, during the pedagogical intervention, PSTs need to analyse what is being performed to make effective decisions, which requires the ability to reflect-in-action. Finally, an evaluation phase encourages PSTs reflect on what they have done in the previous two phases, that is, they need to reflect on reflection-in-action to understand what can be done next to improve their teaching. All these phases are cyclical in nature, as they interact and inform each other (Schön, 1987).

Previous empirical investigations in the field of teacher education have demonstrated that ‘reflection-on-action’ is usually highlighted and used by teachers (Umutlu & Kim, 2020). To date, investigation focus on the impact of developing reflection-in-action and reflection on reflection-in-action reveals scarce on scientific literature. Both moments, however, are essential, for PSTs not only to do not get ‘stuck’ in the middle of their practical problems, but also because each moment of reflection can provide more information about their teaching practice and contribute to deepen their reflection content (Cavanagh & McMaster, 2015a; Umutlu & Kim, 2020). Namely, the interplay, and development of such temporal dynamics of reflection could open possibilities to attribute meaning of the pedagogical experiences lived by PSTs, facilitating and raising the ability to be critical about their practice (Ravanal Moreno et al., 2021).

Specifically in the complex and ever-changing context of Physical Education (McEvoy et al., 2015), PSTs must make spontaneous decisions, not only based on what is happening at that particular moment but also according to the insights that emerge from previous reflections. Although empirical research has highlighted the temporal dynamics of reflection in teaching as a prerequisite for professional development (Mälkki & Lindblom-Ylänne, 2012), to the best of our knowledge there is no research that shows how these temporal dynamics can help PSTs developing and nurturing their reflection. The exploration of this topic could be particularly relevant to inform how physical education teaching education programs, could be updated to address the development of such skills in PSTs training.

Especially for PSTs who face the complexity of real-life situations, they

need to 'reflect-in-action' (Umutlu & Kim, 2020) and 'reflect on reflection-in-action' (i.e. what is most difficult for PSTs to develop). Scientific literature has been argued that PSTs' own thinking process needs to be more structure to evolve their ability to reflect (Lee, 2010). In this regard, peer observation and written reflection has been indicated as efficient pedagogical strategies to structure the reflection procedures (Almusharraf, 2020).

Peer observation can be a valuable strategy for developing 'reflection-in-action' for PSTs as it promotes analysing, reflecting and making decisions about teaching (Engin & Priest, 2014), as well as it helps PSTs obtain a meaning from practice based on and observational analysis (Lawson, 2018). However, learning through observation is not just imitating (Bandura, 1977), therefore observing someone teaching might not be enough to develop PSTs' reflection, and its temporal dynamics.

In a complementary viewpoint, written reflections can provide PSTs with a personal space to clarify their own thoughts, helping to systematise their ideas (Lee, 2010). Through writing, PSTs could look at an event and record their thoughts, while formulating questions about their own practice (Richards & Farrell, 2005). Doing so, PSTs could analyse the attitudes of their peers, contrasting attitudes, problems, and solutions thereby expanding their understanding about teaching-learning process (Gadsby, 2022). Several studies have shown that through written reflection, PSTs construct their own understanding of problems inherent of their personal teaching experiences, rather than adopting ideas from others in a passive manner (e.g., Suphasri & Sumalee, 2021; Yu & Chiu, 2019). Nevertheless, some support is also proclaimed in written reflection (Cengiz, 2020), namely a guided collaborative and intentional support that help PSTs leading their reflections to a deeper interpretation of their lived pedagogical experiences and guiding, in consequence, to the development of their own understandings.

Accordingly, the combination of peer observation and written reflection with appropriate support can, therefore, develop a dynamic interplay of different reflection' timings (Roffey-Barentsen & Malthouse, 2013). Indeed, written reflection combined with peer observation not only increases self-awareness

(Korucu Kis & Kartal, 2019), but also the focus and complexity of PSTs' reflections (McCormack, 2001). Research in PE has been highlighted reflective writing and peer observation as predominant strategies to promote PSTs' reflection (see Azevedo et al., 2022). However to our knowledge, there have been no studies that have examined, in a complementary fashion, the combination of peer observation and written reflection pedagogical strategies to develop the temporal dynamics of reflection in PST.

Thus, following an action-research design during a PE academic year, the present study aimed to examine how peer observation combined with written reflection impacted on developing the temporal dynamics of PSTs' reflection.

Methodology

Study Design

Given its reflexive and interventionist nature, this study followed an action research design (AR) (Lewin, 1946). The AR design allowed the external facilitator (EF) to consciously adjust and intentionally plan the pedagogical intervention during the cyclical process of planning, acting, observing, and reflecting on practice (Coghlan, 2019). Particularly, the EF, with her knowledge, experience, willingness to dialogue, and persistence, promoted a critical and self-analysis of PSTs (T Marshall et al., 2022). During the three AR-cycles, the EF provided ongoingly support for PSTs developing their reflection ability, with a particular focus on different timings of reflection. Here, the peer observation and written reflection were the main pedagogical strategies used to tailor-made the support provided by the facilitator to satisfy the individual needs of each PST. Namely, the role of EF was to understand the PSTs' moment of reflection were doing (i.e. PSTs' analysis of their own pedagogical practice and when such analysis took place) and, based on this information, to provide targeted and tailored support to the PSTs to develop further moments of reflection.

As recommended by Gilbourne (1999a), the AR involved firstly a diagnosis phase in which the EF become familiar with the ability of PSTs reflect at different moments. At this phase, the EF examined the content, timing and difficulties faced by PSTs during their pedagogical practice. In the two subsequent AR-

cycles, an attempt was made to develop 'reflection-in-action' and 'reflection on reflection-in-action', with peer observation and written reflection being introduced and adapted to help PSTs develop the interplay and temporal dynamic of reflection.

Context and Participants

Six PSTs participated in this study during the 2017-2018 academic year. All the participants belong to a Portuguese faculty of sports science. Throughout the school year, the PSTs were supervised by a cooperating teacher and a supervisor from the faculty. Purpose and convenience sampling criteria were used to select the six PSTs (Sarstedt et al., 2018). Participants were selected based on their availability, willingness to participate and affiliation with the same school placements (i.e., doing practicum in the same schools' context). The first author performed the dual role of researcher and external facilitator. She has seven years of experience as a dance teacher and holds a master's degree in teaching Physical Education. This study followed the guidelines of the Declaration of Helsinki and it was approved by the institutional research ethics committee of the first author's institution. Participants were informed about the scope of the study and signed an informed consent form. Confidentiality and anonymity were declared and ensured using pseudonyms.

The temporal dynamics of reflection: a conceptual framework

As the pedagogical practice took place in real-time the ability to reflect-in-action reveals paramount. When PSTs reflect-in-action, they note something of potential value during their current activity and point out what might be added to their skills or understanding in the future (Schön, 1987). Thereby, 'reflection-in-action' encompasses a critical thinking when the action occurs. However, to reflect on the practice, PSTs need to think about the time after their pedagogical intervention. That is, PSTs need to reflect-on-action, so that they can look back at one or more recent experiences and find out what they can retrieve to improve their pedagogical skills and understanding of the teaching-learning context (Moon, 2013). In addition, PSTs need to 'reflect on reflection-in-action' as this

activity aims to produce a good verbal description of ‘reflection-in-action’ that can be shared with peers. Through this reflection moment, PSTs can look back at the action (i.e., pedagogical intervention), reflecting on the moment of reflection-in-action (Schön, 1987). Grounded on the conceptualisation of Moon (2013) and Schön (1987), we summarised the reflection moments abovementioned, as well as the key elements of peer observation and written reflection (see Figure 1).

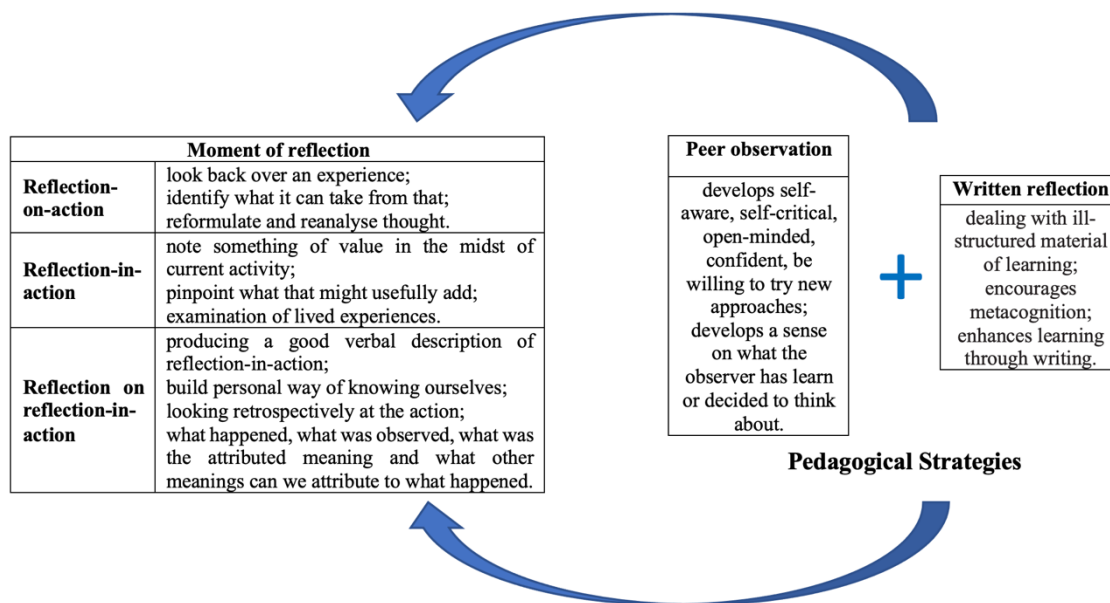


Figure 1. Timing of reflection adopted by Schön (1987) and Moon (2013) and strategies to develop reflection adopted by Moon (2006) and Cosh (1998).

Data collection

The present study used multiple sources to better understand the temporal dynamics of reflection of PSTs (Denzin, 2012). Data collection included focus group interviews (FG), reflective journals (RJ), participant observations (i.e., external facilitator), and non-participant observation (i.e., peer observation). This sequence on data gathering was repeated throughout the academic year to gain a comprehensive and coherent picture of the moment and content of PSTs' reflections. The data collection phase followed the general cyclical pattern of AR (Patton, 2015).

The AR-cycles were initiated by a FG with a total of three semi-structured

sessions (Patton, 2015) (one per AR cycle), in which a list of questions was prepared to stimulate discussion. Here, the EF had the opportunity to explore any new theme that might emerge, which were also further explored (Freebody & Freiberg, 2006). The FG was audio-recorded and subsequently transcribed verbatim by the first author. The FG was conducted by the EF in the faculty and lasted about 110 minutes. The FG interviews aimed to explore the PSTs' thoughts and doubts about their own pedagogical practice, to understand their temporal dynamics of reflection (i.e., which moment of reflection they were reaching), as well as to clarify some ideas that were not so clear in their RJ or participant observation (Patton, 2015).

A total of 18 participant observations (three per PST) were conducted by the EF, in the schools where PSTs were performing their pedagogical practicum. The participant observation allowed the EF diagnosing the ability of PSTs reflect at different moments and difficulties faced by them during their pedagogical practice, while also motivated PSTs to reflect on their own pedagogical intervention and, utmost, to share their reflections with their peers. Moreover, participant observations enabled PSTs debate the observation of different teaching practices, encouraging PSTs to criticise the reasons and assumptions associated with their personal perspectives of teaching (Haigh, 2005). Particularly, participant observation provided an opportunity to understand how PSTs' thoughts were expressed in their teaching practice and to access any practice-related issues that could not be verbalised (Öhman & Quennerstedt, 2012). The EF designed pedagogical actions (i.e., questioning) for the PSTs to address in the following sessions and express their thoughts in the next FG and RJ.

The third step involved non-participant observation (i.e., peer observation) aimed to develop 'reflection-in-action' of PSTs. The peer-observation was conducted by the group of PSTs while observing a colleague teaching a PE class, and enabled an ongoingly group reflection. Peer observation allowed PSTs see how their colleagues dealt with many of the similar problems that themselves faced daily. In addition, it helped them narrow the gap between the PSTs' ideas of teaching and what actually happened during the PE lessons (Richards &

Farrell, 2005).

The reflective journals were written by the PSTs and aimed to describe, reflect, examine, and criticise their pedagogical experiences. PSTs wrote a total of 18th reflections (three per PST), including information about their participant and peer observations, as well as any other thoughts and insights that could emerge. Namely, in each written reflection PSTs could identify their weaknesses, strive for improvement, and connect their existing knowledge with new information (Abednia, Hovassapian, Teimournezhad, & Ghanbari, 2013). Specifically in this study, written reflections were used to help PSTs reflect on various aspects of teaching in the context in which they were working and rethink their ideas about teaching and reflection (Lee, 2007).

Data analysis

Aligned with the cycle and interactive nature of an AR-design, the collection and analysis of data were ongoingly intertwined to develop new explanations that might better fit the unique features emerging from the data (Patton, 2015). As it is almost impossible to be fully inductive in research (Braun & Clarke, 2019), initially it was followed procedures of a deductive process, with themes being developed concomitantly with data analysis (Nowell et al., 2017). Initially, the deductive approach was needed because the formulation of the interview questions and the research goals resulted from the adopted conceptual framework (i.e., Figure 1). Nevertheless, the study gradually became largely inductive, as the themes that emerged from the discussions of the PSTs (Maine et al., 2017).

Given the potential for the researcher to identify, analyse, and report patterns (or themes) within a large data set, the thematic analysis was used to examine the data set (Braun & Clarke, 2012). The thematic analysis involved six stages (Braun & Clarke, 2019). The first coding stage involved the researcher become familiar with the entire dataset through repeated reading. In the second stage, initial codes were created from the data obtained in the FGs, RJs, POs and participant observation and manually added line by line to identify critical categories (i.e., deductive approach) (Nowell et al., 2017). The third phase involved the generation of themes related to the content and temporal reflection

of the PSTs, as well as the pedagogical strategies implemented by the EF. At this phase, written notes were added to assist the authors interpret the data (i.e., inductive approach). The fourth step involved the confirmation that the themes represent explicitly the excerpts coded and the whole dataset by creating a thematic map of analysis. The fifth phase included going back and forth through the data repeatedly to check if the analysis could have misrepresented the data through poor coding, and to ensure that the structure of the temporal dynamics of reflection aligned with the concepts portrayed in Figure 1. The sixth phase involved (re)naming the identified themes in a way that captured the temporal effect of the AR epistemology (i.e., the same themes reported over the three cycles might present different configurations).

Trustworthiness

To acknowledge the potential consequences of the researcher's presence, several trustworthiness criteria were adopted (Coghlan, 2019), namely: (i) Participants were encouraged to share their honest opinions and viewpoints during the FG, so that PSTs' views were not influenced by each other- Thus all PST's thoughts were valued equally by the EF (Patton, 2015); (ii) Data triangulation, which implied the use of multiple data collection sources (i.e., FG, participant and peer observation, and RJ) intending to describe phenomena from different perspectives (Denzin, 2012); (iii) regular peer briefings and data analysis within the research team to minimise the risk of individual researcher bias in interpretive analysis (i.e. ,critical friend) (Patton, 2015); and (iv) PSTs were frequently asked about the implicit meaning of their actions and verbal interventions (Corbin & Strauss, 2014). These procedures regulated the limits of subjectivity, contributing to minimize the individual research bias (Nowell, Norris, White, & Moules, 2017).

Results

Diagnosis phase – ‘*Reflection, what does it mean exactly?*’

Initially, the PSTs showed that they did not attribute any value to the concept of reflection, associating it with one of the numerous tasks related to

teacher's work: *'Sara - for me, reflection is only important because reflection is another one of the thousand things a teacher has to do.'* The PSTs looked at reflection as something that takes time: *'António – we do it because we have to. It is part of', but basically it is a waste of time, you have to be there thinking about what to write. It takes a lot of time.* Moreover, the PSTs demonstrated that they did not understand the meaning of reflection: *'António – to reflect is to think, isn't it? Reflecting is seeing if our plan is done well, if the lesson went well or not (...).'* Also, initially they were confused with the exhaustive description of all the actions that must be performed during the lessons: *'Sara – it is being there, thinking of every little thing we did, and writing everything down without forgetting anything'* Still, PST were not aware of how reflection could impact on their professional development: *'Maria – honestly, we reflect now [during the pedagogical practicum] because we do not have any experience, otherwise we certainly would not reflect, the experience would already be enough.'* In addition, initially it was impossible for the PSTs analyse and decide while the lesson was occurring: *'Paulo - It is not possible for me to think about all the things that happen when I am teaching.'*

1st AR-cycle – *'I think later because I have time and peace to understand how it was.'*

Based on the difficulties diagnosed by the facilitator, PST were invited to explore the meaning of reflecting at different moments *'Facilitator – You can reflect during, immediately after and sometime after the lesson, these ideas will help you improve your quality when you are teaching.'* Thus, the PSTs showed a preference for analysing the lesson immediately after it occurs: *'Sara - I am barely done with the class and I immediately think about what I could have done.'*

Distancing themselves from what was happening in class and reducing tensions related to teaching (i.e., reflection-on-action) provided PSTs a self-consciousness that was recognised by themselves as fundamental to reflect: *'Maria - (...)At home I have time and peace to do it without pressure, I can think about everything that happened in class and reflect.'* In addition, PSTs felt that retrospective interpretation of what they experienced in class encouraged

reflection-on-action, as the *tempo* is needed to identify and consider multiple elements that might contribute to understanding critical situations in class: *'Gustavo - (...) You see, everyone is more effective when they have time to think. So, we can think about many things that we did not see at that moment. It is not possible at the moment, only later.'* The PSTs showed that this kind of retrospective reflection was the only one they made, and that they cannot analyse their pedagogical intervention in other moments: *'Sara - so for me it is obvious that we can only evaluate what happened if we have something past that allows us to have something to think about, otherwise do we reflect about the air?'* Indeed, PST demonstrated that the understanding and relationship between the elements of the class necessary to find solutions can only be achieved at a later moment (i.e., reflection-on-action) and never in the meanwhile of the pedagogical intervention as reported by Maria: *'For example, how can we establish cause-effect relationships in class? In class, I cannot even understand or relate all things (...) only after class I think about how to develop a better strategy.'*

2nd AR-cycle – *'Reflecting about the actions of others helps me to understand how to decide in the moment.'*

Once PST had already achieved the reflection-on-action, during this second AR-cycle the EF stimulated the ability of PST reflect-in-action by questioning them during FG interviews: *'Facilitator - can you explain me then what do you think about when you are teaching?'*

During the analysis, the PSTs noted that they examined the lesson in a retrospective fashion, but also were used to think about what was happening during the class (i.e., reflection in action): *'Gustavo – suddenly, I have the impression that while I am teaching the class, I was thinking about what I am going to do next. I am not just analysing afterwards, I am analysing during. I think.'* However, despite PSTs tended to see what was happening, they did not change their pedagogical intervention: *'Gustavo - look, for example, I see that they could roll their body better while doing the roll...'* Other PSTs tended to focus on the content of the reflection-in-action and made a connection between the students' engagement in the task and their preference for the sport: *'António - I am there*

thinking that as they do not like football at all, they are not engaged in the task.'

Given the difficulties showed by PST in focusing on their own actions during the analysis and to intervene in the lesson (i.e., reflection-in-action), the facilitator asked PSTs observe the colleagues' lessons and suggested that they prepare a written reflection about those peer observations. In particular, the facilitator encouraged reflection on possible rationales for the choices made by the colleagues to help PSTs focus their attention on particular aspects: *'Facilitator - So when you observe your colleagues, I want you to understand how and why they behave the way they do? When they stick to the plan, when they change it, what made them change it or not? And what do you think about all this?'*

The observation of their colleagues stimulated the PSTs' confrontation with their own difficulties: *'Sara - when I saw them, I thought that I also have similar problems.* Moreover, it stimulated their self-criticism: *'Paulo - after this observation I could see that I also have to pay attention to my posture when I am speaking in front of the class (...).'* While they were analysing their colleagues, PSTs started to question their own practice, becoming aware of their actions and transferring the way they should act if confronted with the similar situation (i.e., reflection-in-action): *'Gustavo - when I saw them, I thought that I should not act like that in their place (...).'* Furthermore, peer observation fostered the ability of PSTs place themselves in the shoes of their colleagues, but also to explore future solutions for their own pedagogical intervention: *'Maria - when I saw them, I realised that if I were in the same situation, I would not act in the same way, because it did not seem to have sustainable results for the class.'*

On the other hand, observing their peers enabled the PSTs recognize the need to seek and study information that support a better decision-making in practice: *'Gustavo - (...) but I still do not know how to act, so I need to research and talk more about it to find appropriate solutions',* look for new ways to solve the same problems: *'Sara - while I was watching them I was thinking of a thousand and one ways to solve these problems, if one day the same thing happens to me I will already have some solutions.'* and understand that it was necessary to go beyond perspective and show solutions on how they could act in a future situation: *'Paulo (...) so in the next classes I should moderate my tone,*

because that can make them feel a bit intimidated.'

Peer observation was crucial in making the PSTs aware of the importance of reflecting during the action, as it supports the change on pedagogical intervention in real time, improving the quality of the practice. This was particularly highlighted in Paulo's perspective: *'After watching them, I thought that I had to change something immediately. Today I realized that I was only concerned about the exercise and watching them performing it, but what I need to see if they had really noticed what the idea of the task was. So I interrupted the task and explained it again.'*

The written reflection showed to be valuable in helping the PSTs to better interpret the context of each pedagogical practice: *'Gustavo – when I write, I have the opportunity to develop my ideas about what happened while I was observing my colleagues teaching'* and also to raise complex questions about their own practice *'Gustavo – I have also found that I question my interaction with the students, searching for the key to unlock such the relationship. I am responsible for this.'* Additionally, by writing about the observed elements, PST were able to clarify the verbalised ideas, revealing an understanding about the importance of establishing a relationship ideas among them: *'Paulo – (...) it is important to understand what contributes to the lesson not going as expected, and therefore I cannot ignore my presence, but I have to include it in the analysis along with the students' behaviour.'*

This ability of PSTs to reflect-in-action (i.e., intervene in the classroom to resolve teaching-learning issues) was particularly noted by the facilitator during the participant observation: *'Facilitator - It should also be noted that António, in reason of some students' difficulties in performing an action, interrupted the exercise and adapted it to facilitated students' understanding'.*

3rd cycle – *'When I reflect on past ideas, I can understand other possibilities and rearrange my thoughts.'*

At the beginning of this cycle, although the PSTs had already been developing reflection-in-action, they lack on reflection on a particular topic in past (i.e., reflection on reflection in-action): *'António - I would think about the same*

thing I am thinking now (...)'. Thus, to become PSTs aware of the change in their praxis, the facilitator stimulated them to analyse how they had understood their actions at the beginning of their professional internship '*Facilitator - how did you think at the beginning and how do you think now? Has something changed?*'. This question initiated a critical debate among PST: '*Gustavo - Well, before class you could not even breathe properly, not even a fly could fit in your head with so many memories (...) today you are already breathing and acting.*'; Sara – *it is true. Today I realise that it is not just about observing a lot of things, but focusing on what is really important*'. Also, the analysis of past events enabled PSTs recognise the limits of their reflections and understand their mistakes, as reported by Sara and Maria: '*Sara - when I saw her [Cooperant Teacher] freaking out, I remembered that she had reacted like that too and I realised that I had changed. Today I already think that does not get me anywhere and I take a deep breath; Maria - I know now that I was wrong, I never worried so much about the bad conditions at school or complained so much.*'

To trigger the re-evaluation and reformulation of the PSTs' ideas, the EF invited them writing on their previous thoughts: '*Facilitator: I would like that you analyse your initial RJ, contrasting your past reflections with the last ones. If you find out that your thinking has been changing, try to reflect about why it happened and how it helped becoming a better teacher.*' Through this retrospective analysis, the PSTs noticed that in the past their reflections did not include aspects that they consider essential today: '*António - it is possible to verify that my ideas were closely related to the fulfilment of the class objectives (...) they did not include the behaviour of the students, the environment of the class, my readiness to teach this subject. I noticed that this [thinking about past ideas] allowed me to analyse [pedagogical intervention] more effectively now.*' Complementarily, peer observation revealed vital for PSTs know *a priori* what concrete elements they should focus on during peer analysis, which helped them gain space to connect thoughts: '*Gustavo - now I have a kind of mental space to know immediately what I should focus on my critique, and I know what points I should pay attention to, and of course I do not feel the pressure of teaching the class myself.*'

Through peer observation and written reflection, PST examined their

original attitudes, becoming aware of their initial mistakes and how it contributed to guide their professional development at this stage, namely: *‘Maria - when I think of who this teacher was in the beginning, I think about these problems, and I do not want to repeat them.’* The PSTs recognized how limited was to reflect exclusively based on behavioural steps (i.e., focusing on performance) without considering themselves and the circumstances of their pedagogical intervention: *‘António - it is strange to notice that I thought that I was thinking about everything, but today I notice that these thoughts were very focused on the checklist (included or not included). Although today I am better at thinking about what I do in the class, I am also aware that I still need experience to improve my analysis and be more effective in teaching.* Nevertheless, the PSTs still sharing difficulties in using their new thoughts into practice, as Gustavo expressed: *‘I mean, I am well aware of that stuff, but I am not sure that I am able to do it.’*

Discussion

Through an AR-design conducted over an academic year in the context of PE, the present study aimed to examine how peer observation combined with written reflection impacted on developing the temporal dynamics of PSTs’ reflection. Overall, findings highlighted the impact of an intentional structured combination of peer observation and written reflection in developing PSTs’ reflections, particularly from a dynamic temporal perspective. Indeed, through the support of the EF, the combined use of peer observation and written reflection seemed to have influenced the ability of PSTs reflect in different moments, enriching in consequence the content of their own reflections. In this sense, findings highlighted that PSTs were not only able to understand the different moments of reflection over time, but also to recognise that each one encompasses different perspectives which, when combined, can develop their quality of reflection. In parallel, PSTs have improved their pedagogical practice by no longer focusing only on themselves and their own performance, but also by being able to think more and better about the students’ needs.

One of the elements that might have contributed to the development of PSTs’ reflection was the interventive nature of AR-design, which allowed the EF

to adapt, and monitor ongoingly her pedagogical strategies since the diagnostic phase. Emphasizing the importance of supporting continuously the development of PST's reflection, our findings corroborate the assumptions of Denha et al. (2022) and Krapivnyk et al. (2021) who stated that if reflection is not explicitly and purposefully achieved in the pedagogical process, the work may be ineffective. In the same vein, previously Wopereis Sloep and Poortman (2010) argued that probably the most important condition for acquiring good reflection is a high-quality guided practice rather than simply given tasks to reflect on.

Regarding the analysis of each AR-cycle, since the diagnostic phase, the EF identified that PSTs did not understand the reflection process (i.e., how it occurs, what is its importance on their professional developing). Afterwards, over the first AR-cycle, the PSTs demonstrated that they were reflecting mostly on their own pedagogical intervention it has occurred (i.e., reflection-on-action). As reported by PST, this temporal distance was needed to reflect by affording 'thinking material' to reflect and interpret their practice. In this regard, the tendency for novice teachers reflect mainly on action was recently pointed by Chen (2023).

To encourage PSTs reflect-in-action, in the second AR-cycle, the EF suggested that PSTs observed the classes of each other (i.e., peer observation) and developing written reflection on those observations. Also, EF provided some tips to guide PSTs' attentional focus during the class observation. The integration of such strategies enabled PSTs confront their own insecurities, examine their own pedagogical interventions and seek for new ways to solve similar problems. Specifically, written reflection revealed to be crucial in helping the PSTs examine what, how and why of their thoughts. Indeed, when writing about pedagogical intervention of their colleagues, PSTs had '*the opportunity to develop my ideas*', as expressed by Gustavo. Doing so, the ability to question their own practice in complex ways was highlighted. In addition, the PSTs were able to see the importance of clarifying their thoughts and stabilising a relationship between ideas. Here, the PSTs noticed that written reflection about derived from peer observation, allow them to construct solid arguments in relation to their own pedagogical intervention, which also enabled them to reflect-in-action (i.e.,

thinking about how to act in similar situations).

As Schön (1987) explained, reflection-in-action requires the development of critical thinking. Thus, our findings show that when PSTs combining both pedagogical strategies, they were able to include the above elements in their analysis and developed critical thinking skills. Namely, PSTs enhanced their ability to identify the what, how and why of their actions during the lesson (i.e., reflection-in-action) (Schön, 1987). Although the literature has been widely emphasized the importance of tools to develop reflection of teachers (Hammersley-Fletcher & Orsmond, 2005; Mouraz et al., 2022) and help them to understand their own reality (Batlle, 2023), studies have mainly focused on developing tools to promote 'reflection-on-action' (Umutlu & Kim, 2020) rather than in-action. In contrast, our findings suggest that the PSTs' reflection-in-action seems to have been prompted through the combination of peer observation and written reflection.

At the last AR-cycle, the EF aimed to stimulate PSTs analyse their past reflections and oldest thoughts expressed in RJ, contrasting it with the recent ones (i.e., developing reflection on reflection-in-action). Findings exhibited that through supported and structured written reflection, PSTs were able to pause and think twice on their initial 'written' thoughts to accomplish better insights. In this regard, the temporal distance afforded by peer observation revealed to be useful for PSTs have 'mental space' to know which elements were relevant focus on when analysing their colleagues.

Therefore, through the interactive process between peer observation and written reflection within this AR-cycle, the PSTs were able to reconsider their original thoughts, confronting it with the actual ones. Thus, PSTs noticed that, initially, they did not consider the elements they now deemed as vital to reflect about. In particular, they emphasised the importance of analysing their past actions and thoughts to develop an awareness of their mistakes and look for ways to avoid them. Revisiting Liu's (2015) work highlighting the elements of critical reflection, the PSTs developed a critical reflection level by using such elements at this point. In contrast to the critical thinking skills that PSTs had demonstrated in the previous AR cycle, PSTs were also able to constantly analyse, question

and critique established assumptions about themselves.

To summarise, in our study the peer observation and the written reflection, when combined and properly structured, seemed to have helped PSTs in developing their ability to reflect in the moment (i.e. reflection-in-action) and to re-examine their past reflections (i.e. reflection on reflection-in-action). Thus, the combination of both pedagogical strategies enabled PSTs reflect in a 'freeway', without pressure of assessment. As De Martin Silva and Mesquita (2016) examined, in a longitudinal study of student coaches learning, the nature of assessment severely limits the opportunities for learners analyse themselves. When PSTs are asked to reflect-in-action as part of an evaluation, they tend to engage in false reflection or compensatory reflection at the end of the design process (Zhang et al., 2023), while others even fake their reflection to gain approval from their supervisors (Suphasri & Sumalee, 2021). In our findings, both pedagogical strategies did not have an evaluative character, but an inclusive and constructive perspective that enabled the PSTs to ongoingly re-examine themselves and their pedagogical intervention. Accordingly, PSTs understood their weaknesses as an opportunity to grow up as teacher and develop their reflection ability.

Final thoughts

The findings of this study provide a new understanding of how the combination of peer observation and written reflection can impacted on developing the temporal dynamics of PSTs' reflection and to teach them how to use such tools to enhance their own professional development. In fact, through peer observation and written reflections, PSTs were able to understand their own problems and the need to look for new and better solutions, which enabled them to reflect in an action-oriented way, re-evaluate their previous reflections and improve their quality of reflection.

Despite the potential of the interaction between the respective pedagogical strategies, the development of the temporal dynamics of reflection needs to include other strategies (e.g., video diaries, web forums, peer lessons, questioning and collaborative reflection). The use of diverse strategies, in a

complementary, structured and intentional fashion, might guide PST identify and examine their lived experiences from different points and perspectives in time, stimulating their ability to interpret the particularities of each educational context. Therefore, future studies should focus on investigating specific pedagogical strategies that promote reflection among PSTs, implementing, monitoring, intervening and adapting to the particular practice to each PST needs.

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References

- Almusharraf, A. M. (2020). Student Teachers' Development of Reflective Practice Concerning Teaching Philosophy and Peer Observations. *Arab World English Journal*, 11(4), 547-564. <https://doi.org/https://dx.doi.org/10.24093/awej/vol11no4.35>
- Azevedo, Araújo, & Mesquita. (2022). The development of reflective skills in physical education teacher education: a systematic review. *Retos: nuevas tendencias en educación física, deporte y recreación*, 46, 162-178. <https://dialnet.unirioja.es/servlet/articulo?codigo=8562027>
- Bandura, A. (1977). Self-efficacy: Toward a unifying theory of behavioral change. *Psychological Review*, 84(2), 191-215. <https://doi.org/10.1037/0033-295x.84.2.191>
- Batlle, J. (2023). Hosting collectivity: 'We' as a person reference in interactional reflective practice in peer observation sessions. *Linguistics and Education*, 73, 101147. <https://doi.org/https://doi.org/10.1016/j.linged.2023.101147>
- Braun, V., & Clarke, V. (2012). Thematic analysis (*APA handbook of research methods in psychology, Vol 2: Research designs: Quantitative, qualitative, neuropsychological, and biological*). (pp. 57-71). American Psychological Association. <https://doi.org/10.1037/13620-004>
- Braun, V., & Clarke, V. (2019). Reflecting on reflexive thematic analysis. *Qualitative Research in Sport, Exercise and Health*, 11(4), 589-597. <https://doi.org/10.1080/2159676X.2019.1628806>
- Cavanagh, M., & McMaster, H. (2015). A professional experience learning community for secondary mathematics: developing pre-service teachers' reflective practice. *Mathematics Education Research Journal*, 27(4), 471-490.
- Cengiz, C. (2020). The effect of structured journals on reflection levels: With or without question prompts? *Australian Journal of Teacher Education (Online)*, 45(2), 23-43. <https://doi.org/http://dx.doi.org/10.14221/ajte.2020v45n2.2>
- Chen, J. J. (2023). Reflecting on reflection among early childhood teachers: a study of reflection for, in, and on action intersecting with the technical,

- practical, and critical dimensions. *Reflective Practice*, 1-23.
<https://doi.org/10.1080/14623943.2023.2194624>
- Coghlan, D. (2019). *Doing action research in your own organization*. Sage.
[https://books.google.pt/books?hl=pt-PT&lr=&id=nMGKDwAAQBAJ&oi=fnd&pg=PP1&dq=Doing+action+research+in+your+own+organization.+Sage.+++Corbin,+J.,+%26+Strauss,+A.+\(2014\).+Basics+of+Qualitative+Research:+Techniques+and+Procedures+for+Developing+Grounded+Theory.+Sage+Publications.&ots=z891mk3Yrh&sig=BR9H4fkRiIK9pLTJDcKqIM8b3Nc&redir_esc=y#v=onepage&q&f=false](https://books.google.pt/books?hl=pt-PT&lr=&id=nMGKDwAAQBAJ&oi=fnd&pg=PP1&dq=Doing+action+research+in+your+own+organization.+Sage.+++Corbin,+J.,+%26+Strauss,+A.+(2014).+Basics+of+Qualitative+Research:+Techniques+and+Procedures+for+Developing+Grounded+Theory.+Sage+Publications.&ots=z891mk3Yrh&sig=BR9H4fkRiIK9pLTJDcKqIM8b3Nc&redir_esc=y#v=onepage&q&f=false)
- Corbin, J., & Strauss, A. (2014). *Basics of Qualitative Research: Techniques and Procedures for Developing Grounded Theory*. Sage Publications.
<https://genderopen-develop.ub.hu-berlin.de/bitstream/handle/25595/12/whatsnew7.pdf?sequence=1>
- Cowan, J. (2006). *On becoming an innovative university teacher: Reflection in action: Reflection in action*. McGraw-Hill Education (UK).
[https://books.google.pt/books?hl=pt-PT&lr=&id=Ue31eCZm1LwC&oi=fnd&pg=PP1&dq=Cowan,+J.+\(2006\).+On+becoming+an+innovative+university+teacher:+Reflection+in+action:+Reflection+in+action.+McGraw-Hill+Education+\(UK\).+&ots=GAM8O4ER3D&sig=bkEmEo4AAobiBOahojtMlhLZ_aq&redir_esc=y#v=onepage&q=Cowan%2C%20J.%20\(2006\).%20On%20becoming%20an%20innovative%20university%20teacher%3A%20Reflection%20in%20action%3A%20Reflection%20in%20action.%20McGraw-Hill%20Education%20\(UK\).&f=false](https://books.google.pt/books?hl=pt-PT&lr=&id=Ue31eCZm1LwC&oi=fnd&pg=PP1&dq=Cowan,+J.+(2006).+On+becoming+an+innovative+university+teacher:+Reflection+in+action:+Reflection+in+action.+McGraw-Hill+Education+(UK).+&ots=GAM8O4ER3D&sig=bkEmEo4AAobiBOahojtMlhLZ_aq&redir_esc=y#v=onepage&q=Cowan%2C%20J.%20(2006).%20On%20becoming%20an%20innovative%20university%20teacher%3A%20Reflection%20in%20action%3A%20Reflection%20in%20action.%20McGraw-Hill%20Education%20(UK).&f=false)
- Cowan, J., & Stroud, R. (2016). Composting reflections for development. *Reflective Practice*, 17(1), 27-33.
<https://doi.org/https://doi.org/10.1080/14623943.2015.1123684>
- Davis, E. A. (2006). Characterizing productive reflection among preservice elementary teachers: Seeing what matters. *Teaching and Teacher Education*, 22(3), 281-301.
<https://doi.org/https://doi.org/10.1016/j.tate.2005.11.005>
- Denha, N., Kyrylenko, K., Syvokhop, E., Yermakova, S., Stepanchenko, N., & Bilanych, H. (2022). Methodical Work as a Means of Developing Professional Reflection of Teachers. *Revista Romaneasca pentru Educatie Multidimensionala*, 14(2), 363-392.
<https://doi.org/https://doi.org/10.18662/rrem/14.2/586>
- Denzin, N. K. (2012). Triangulation 2.0. *Journal of Mixed Methods Research*, 6(2), 80-88. <https://doi.org/10.1177/1558689812437186>
- Dewey, J. (1933). How We Think [Book Review]. *Journal of Education*, 116(12), 321-321.
<http://search.ebscohost.com/login.aspx?direct=true&AuthType=ip,uid&db=ils&AN=22029848&lang=pt-pt&site=ehost-live&scope=site>
- Engin, M., & Priest, B. (2014). Observing teaching: A lens for self-reflection. *Journal of Perspectives in Applied Academic Practice*, 2(2), 2-9.
<https://doi.org/https://doi.org/10.14297/jpaap.v2i2.90>
- Freebody, P., & Freiberg, J. (2006). Cultural Science and qualitative educational research: Work 'in the first place' on the morality of classroom life.

- International Journal of Qualitative Studies in Education*, 19(6), 709-722.
<https://doi.org/https://doi.org/10.1080/09518390600975909>
- Gadsby, H. (2022). Fostering reflective practice in Post Graduate Certificate in Education students through the use of reflective journals. Developing a typology for reflection. *Reflective Practice*, 1-12.
<https://doi.org/https://doi.org/10.1080/14623943.2022.2028612>
- Gilbourne, D. (1999). Collaboration and reflection: adopting action research themes and processes to promote adherence to changing practice. *Adherence issues in sport and exercise*, 239-262.
- Haigh, N. (2005). Everyday conversation as a context for professional learning and development. *International Journal for Academic Development*, 10(1), 3-16. <https://doi.org/https://doi.org/10.1080/13601440500099969>
- Hammersley-Fletcher, L., & Ormond, P. (2005). Reflecting on reflective practices within peer observation. *Studies in Higher Education*, 30(2), 213-224. <https://doi.org/10.1080/03075070500043358>
- Korucu Kis, S., & Kartal, G. (2019). No pain no gain: reflections on the promises and challenges of embedding reflective practices in large classes. *Reflective Practice*, 20(5), 637-653.
<https://doi.org/https://doi.org/10.1080/14623943.2019.1651715>
- Krapivnyk, G., Tuchyna, N., Bashkir, O., Borysov, V., Gonchar, O., & Plakhtyeyeva, V. (2021). Modelling the Process of Reflection in Pre-Service Teacher Education [Article]. *Romanian Journal for Multidimensional Education / Revista Romaneasca pentru Educatie Multidimensionala*, 13(3), 116-133.
<https://doi.org/10.18662/rrem/13.3/443>
- Lawson, D. (2018). Peer observation, reflection, and evaluation practices in the writing center: A genre pedagogy approach. *Praxis: A Writing Center Journal*.
<https://repositories.lib.utexas.edu/bitstream/handle/2152/65588/242%20Lawson%20PAGINATED.pdf?sequence=2&isAllowed=y>
- Lee, O. (2010). Facilitating preservice teachers' reflection through interactive online journal writing. *Physical Educator*, 67(3), 128.
<https://web.p.ebscohost.com/ehost/detail/detail?vid=1&sid=72c0dee4-c958-400e-ab3c-a2d0e8f0e609%40redis&bdata=JkF1dGhUeXBIPWlwLHNoaWlsdWlkJmXhbm9cHQtcHQmc2l0ZT1laG9zdC1saXZlJnNjb3BIPXNpdGU%3d#db=asn&AN=55232788&anchor=AN0055232788-2>
- Lewin, K. (1946). Action research and minority problems. *Journal of social issues*, 2(4), 34-46.
http://www.fionawangstudio.com/ddcontent/Instructions/action_research/readings/Lewin_1946_action%20research%20and%20minority%20problems.pdf
- Liu. (2015). Critical reflection as a framework for transformative learning in teacher education. *Educational Review*, 67(2), 135-157.
<https://doi.org/https://doi.org/10.1080/00131911.2013.839546>
- Maine, A., Dickson, A., Truesdale, M., & Brown, M. (2017). An application of Bandura's 'Four Sources of Self-Efficacy' to the self-management of type 2 diabetes in people with intellectual disability: An inductive and deductive

- thematic analysis. *Research in developmental disabilities*, 70, 75-84.
<https://doi.org/https://doi.org/10.1016/j.ridd.2017.09.004>
- Mälkki, K., & Lindblom-Ylänne, S. (2012). From reflection to action? Barriers and bridges between higher education teachers' thoughts and actions [Article]. *Studies in Higher Education*, 37(1), 33-50.
<https://doi.org/10.1080/03075079.2010.492500>
- Marshall, T., Keville, S., Cain, A., & Adler, J. (2022). Facilitating reflection: a review and synthesis of the factors enabling effective facilitation of reflective practice. *Reflective Practice*, 1-14.
<https://doi.org/https://doi.org/10.1080/14623943.2022.2064444>
- McCormack, A. C. (2001). Using reflective practice in teaching dance to preservice physical education teachers. *European Journal of Physical Education*, 6(1), 5-15.
<https://doi.org/https://doi.org/10.1080/1740898010060102>
- McEvoy, E., MacPhail, A., & Heikinaro-Johansson, P. (2015). Physical education teacher educators: A 25-year scoping review of literature. *Teaching and Teacher Education*, 51, 162-181.
<https://doi.org/https://doi.org/10.1016/j.tate.2015.07.005>
- Miller, P. E. (2022). Reflection-in-action: the use of student audio recordings. *Social Work Education*, 1-15.
<https://doi.org/https://doi.org/10.1080/02615479.2022.2031961>
- Moon. (2013). *Reflection in learning and professional development: Theory and practice*. Routledge.
- Mouraz, A., Pinto, D., & Cristina Torres, A. (2022). Effects of a model for multidisciplinary peer observation of teaching in teacher professional development and in nurturing a reflective school. *Reflective Practice*, 1-14.
<https://doi.org/https://doi.org/10.1080/14623943.2022.2130225>
- Mulryan-Kyne, C. (2021). Supporting reflection and reflective practice in an initial teacher education programme: An exploratory study. *European Journal of Teacher Education*, 44(4), 502-519.
<https://doi.org/https://doi.org/10.1080/02619768.2020.1793946>
- Nowell, Norris, White, & Moules. (2017). Thematic analysis: Striving to meet the trustworthiness criteria. *International journal of qualitative methods*, 16(1), 1609406917733847. <https://doi.org/DOI:10.1177/1609406917733847>
- Öhman, M., & Quennerstedt, M. (2012). Observational studies: Marie Öhman and Mikael Quennerstedt (*Research Methods in Physical Education and Youth Sport* (pp. 192-206). Routledge.
<https://www.taylorfrancis.com/chapters/edit/10.4324/9780203807170-22/action-research-physical-education-anthony-rossi-wah-kiat-tan>
- Patton, M. Q. (2015). Qualitative research & evaluation methods: Integrating theory and practice. [https://books.google.pt/books?hl=pt-PT&lr=&id=ovAkBQAAQBAJ&oi=fnd&pg=PP1&dq=Patton,+M.+Q.+\(2015\).+Qualitative+research+%26+evaluation+methods:+Integrating+theory+and+practice.+&ots=ZR2_9xwGz0&sig=SqqDrzJ51gwEnDJ-euun4ljhov0&redir_esc=y#v=onepage&q&f=false](https://books.google.pt/books?hl=pt-PT&lr=&id=ovAkBQAAQBAJ&oi=fnd&pg=PP1&dq=Patton,+M.+Q.+(2015).+Qualitative+research+%26+evaluation+methods:+Integrating+theory+and+practice.+&ots=ZR2_9xwGz0&sig=SqqDrzJ51gwEnDJ-euun4ljhov0&redir_esc=y#v=onepage&q&f=false)
- Ravanal Moreno, E., Cabello, V. M., López-Cortés, F., & Amórtegui Cedeño, E. (2021). The reflective practice as a tool for making tacit knowledge explicit. *Reflective Practice*, 22(4), 515-530.

- <https://doi.org/10.1080/14623943.2021.1930527>
- Richards, J. C., & Farrell, T. S. (2005). *Professional development for language teachers: Strategies for teacher learning*. Cambridge University Press. [https://books.google.pt/books?hl=pt-PT&lr=&id=D90HFT9UCfQC&oi=fnd&pg=PP9&dq=Richards,+J.+C.,+%26+Farrell,+T.+S.+\(2005\).+Professional+development+for+language+teachers:+Strategies+for+teacher+learning.+Cambridge+University+Press.+&ots=nWpF1iBtY_&sig=5RfS7Z93qegT_GLzenU19CjmeUM&redir_esc=y#v=onepage&q&f=false](https://books.google.pt/books?hl=pt-PT&lr=&id=D90HFT9UCfQC&oi=fnd&pg=PP9&dq=Richards,+J.+C.,+%26+Farrell,+T.+S.+(2005).+Professional+development+for+language+teachers:+Strategies+for+teacher+learning.+Cambridge+University+Press.+&ots=nWpF1iBtY_&sig=5RfS7Z93qegT_GLzenU19CjmeUM&redir_esc=y#v=onepage&q&f=false)
- Roffey-Barentsen, J., & Malthouse, R. (2013). *Reflective practice in education and training*. Learning Matters. [https://books.google.pt/books?hl=pt-PT&lr=&id=IIEDgAAQBAJ&oi=fnd&pg=PP1&dq=Roffey-Barentsen,+J.,+%26+Malthouse,+R.+\(2013\).+Reflective+practice+in+education+and+training.+Learning+Matters.+&ots=ZZBZsjqW2Z&sig=-0yJUzmK3aHr0dbnLI-N7RknKo4&redir_esc=y#v=onepage&q=Roffey-Barentsen%2C%20J.%2C%20%26%20Malthouse%2C%20R.%20\(2013\).%20Reflective%20practice%20in%20education%20and%20training.%20Learning%20Matters.&f=false](https://books.google.pt/books?hl=pt-PT&lr=&id=IIEDgAAQBAJ&oi=fnd&pg=PP1&dq=Roffey-Barentsen,+J.,+%26+Malthouse,+R.+(2013).+Reflective+practice+in+education+and+training.+Learning+Matters.+&ots=ZZBZsjqW2Z&sig=-0yJUzmK3aHr0dbnLI-N7RknKo4&redir_esc=y#v=onepage&q=Roffey-Barentsen%2C%20J.%2C%20%26%20Malthouse%2C%20R.%20(2013).%20Reflective%20practice%20in%20education%20and%20training.%20Learning%20Matters.&f=false)
- Saiz-Linares, Á., & Susinos-Rada, T. (2020). Revisiting reflection in pre-service teacher training: Let's rethink through a practicum in Spain. *Reflective Practice*, 21(5), 629-645. <https://doi.org/10.1080/14623943.2020.1785414>
- Sarstedt, M., Bengart, P., Shaltoni, A. M., & Lehmann, S. (2018). The use of sampling methods in advertising research: a gap between theory and practice. *International Journal of Advertising*, 37(4), 650-663. <https://doi.org/10.1080/02650487.2017.1348329>
- Schön, D. A. (1987). *Educating the reflective practitioner*. Jossey-Bass. <https://psycnet.apa.org/record/1987-97655-000>
- Suphasri, P., & Sumalee, C. (2021). Reflective Practice in Teacher Education: Issues, Challenges, and Considerations [Journal Article]. *PASAA: A Journal of Language Teaching and Learning in Thailand*, 62, 236-264. <https://search.ebscohost.com/login.aspx?direct=true&AuthType=ip,shib&db=mif&AN=EIS155413737&lang=pt-pt&site=ehost-live&scope=site>
- Umutlu, D., & Kim, C. (2020). Design guidelines for scaffolding pre-service teachers' reflection-in-action toward culturally responsive teaching. *Reflective Practice*, 21(5), 587-603. <https://doi.org/https://doi.org/10.1080/14623943.2020.1779049>
- Vygotsky, L. S. (1978). *Mind in society: The development of higher psychological processes*. University Press. [https://books.google.pt/books?hl=pt-PT&lr=&id=RxjiUefze_oC&oi=fnd&pg=PA1&dq=Vygotsky,+L.+S.+\(1978\).+Mind+in+society:+The+development+of+higher+psychological+processes.+University+Press.+&ots=ojD_Y5o6do&sig=XXSLppnspicyVkSP8yelX5fjuNE&redir_esc=y#v=onepage&q=Vygotsky%2C%20L.%20S.%20\(1978\).%20Mind%20in%20society%3A%20The%20development%20of%20higher%20psychological%20processes.%20University%20Press.&f=false](https://books.google.pt/books?hl=pt-PT&lr=&id=RxjiUefze_oC&oi=fnd&pg=PA1&dq=Vygotsky,+L.+S.+(1978).+Mind+in+society:+The+development+of+higher+psychological+processes.+University+Press.+&ots=ojD_Y5o6do&sig=XXSLppnspicyVkSP8yelX5fjuNE&redir_esc=y#v=onepage&q=Vygotsky%2C%20L.%20S.%20(1978).%20Mind%20in%20society%3A%20The%20development%20of%20higher%20psychological%20processes.%20University%20Press.&f=false)
- Wopereis, I. G., Sloep, P. B., & Poortman, S. H. (2010). Weblogs as instruments for reflection on action in teacher education. *Interactive Learning Environments*, 18(3), 245-261.

- <https://doi.org/https://doi.org/10.1080/10494820.2010.500530>
- Yu, W. M., & Chiu, M. M. (2019). Influences on the reflection quality of journal writing: an exploratory study. *Reflective Practice*, 20(5), 584-603. <https://doi.org/https://doi.org/10.1080/14623943.2019.1651712>
- Zhang, Z., Bekker, T., Markopoulos, P., & Skovbjerg, H. M. (2023). Supporting and understanding students' collaborative reflection-in-action during design-based learning. *International Journal of Technology and Design Education*, 1-37. <https://doi.org/https://doi.org/10.1007/s10798-023-09814-0>

Chapter IV – Final Thoughts

4.1. General discussion

The main purpose of this thesis was to explore the development of critical reflection in PSTs during their PE practicums using a long-term AR approach. Additionally, it investigated the role of an EF in developing PSTs' reflective abilities throughout the practicum. The empirical studies focused on: (i) examining the process by which PSTs deconstruct their initial reflections, and subsequently re-signify their understanding, based on challenges encountered in real-world practicum challenges; (ii) exploring how an EF's caring approach can help develop strategies and create circumstances to enhance and deepen PSTs' reflection on their pedagogical practice; (iii) exploring the development of PSTs' critical reflection through an EF's tailored use of questioning; (iv) examining how peer observation combined with written reflection impacted on developing the temporal dynamics of PSTs' reflection.

Therefore, the thesis will be discussed through a synoptic and critical approach, emphasizing the intertwining of findings from various studies. Central to this is understanding and examining the challenges PSTs face in their teaching practices, an essential 'puzzle' in unravelling the development of their critical reflection.

It is also noteworthy that each dimension of the reflection development process considered in this research (understanding reflection concepts, creating a caring environment, using strategies such as tailored questioning, peer observations, and writing reflections) not only nurtured but also influenced each other. Hence, these dimensions served as catalysts, facilitating the development of critical reflection throughout the academic year.

This dynamic process highlighted how the various dimensions of reflection were interconnected, meaningfully contributing to the development of critical reflection. Furthermore, our approach is theoretically grounded, drawing on components from existing literature identified as essential for fostering critical reflection, an aspect scarcely examined in longitudinal, integrative AR studies.

Additionally, the thesis underscores the data's temporal dynamics, a central aspect of AR. This chronological and critical approach offers a thorough and contextualized analysis of the PSTs' reflective development over time,

highlighting their progression through different AR phases.

Hence, the discussion unfolds with an analysis that begins by identifying the initial challenges faced by the PSTs in *'Understanding Barriers: A Multidimensional Diagnosis of PSTs' Reflective Practice'*. It then proceeds to the AR cycle titled *'Preparing the Ground for Growth: Sowing the Seeds of a Multidimensional Approach to Develop Reflective Practice'*. The discourse culminates with the final AR cycle *'Reaping the Harvest Reaping the Harvest: Yielding Growth from the Seeds of a Multidimensional Approach to Develop Reflective Practice'*.

Understanding Barriers: A Multidimensional Diagnosis of PSTs' Reflective Practice

In the initial phase, corresponding to the first AR cycle, the EF focused on examining the PSTs' initial understanding of reflection and its application in their teaching-learning practices. The PSTs exhibited a basic understanding of reflection, often equating it to logistical management and a 'checking aspects' routine, prioritizing compliance over critical understanding. These findings align with other studies suggesting that novices typically have a basic interpretation of reflection, underscoring the need for a broader conceptualization that transcends mere execution of planned activities (Greve et al., 2021; Larrivee, 2008). Our findings highlight the perspective emphasized in research, indicating that PSTs tend to focus on the more apparent elements of PE lessons (Greve et al., 2021), while overlooking the underlying complexities due to the demands of critical thinking and problem-solving (Standal & Moe, 2013).

Simultaneously, the EF encountered challenges in accessing the PSTs' authentic thoughts, as their responses were typically brief, non-committal, and often mirrored their peers' views. This was evident in their reluctance to express individual opinions, often resorting to unanimous agreement without deep engagement, demonstrating their hesitance to fully immerse themselves in the reflective process: *'Yes, I agree. It's the same as my colleagues'*. The 'cycle of fragility' concept (Dorman, 2020), which relates to the evaluative setting PSTs

face during their practicum, may explain their tendency to assume a defensive posture.

In parallel, during the initial stage, another challenge became evident: the PSTs primarily engaged in a basic, superficial level of reflection. This was apparent from their tendency to provide descriptive details about '*timeframes, transitions, instruction*', and focusing on instructional and managerial aspects of their practice, exemplified by statements like '*I stood in front of the class*'. This is consistent with Dervent (2015) findings in a ten-week AR study within a PE context, where early-stage reflections of PSTs primarily revolved around planning, time management, and classroom activities.

Moreover, in this initial phase, the PSTs also expressed reflection as '*a waste of time*', demonstrating a limited awareness of its potential impact on their professional development. They found it difficult to engage in reflection and decision-making during lessons (i.e., reflection-in-action) and were more inclined to reflect post-lesson (i.e., reflection-on-action). This preference was attributed to the complexities they encountered, as one PST stated '*It is not possible for me to think about all the things that happen when I am teaching*'.

This interactive analysis, conducted throughout the first AR cycle, enabled a comprehensive understanding of the PSTs' initial reflective capability, highlighting significant challenges at the onset of their professional journeys. These challenges included a limited grasp of reflective practice, leading to a focus on compliance rather than critical analysis, a hesitance to be vulnerable, a tendency towards basic reflection, and a preference for reflecting-on-action, all of which restricted their capacity for deep thinking and thorough comprehension.

In response the EF implemented deliberate strategies to enhance the PSTs' reflective skills.

Preparing the Soil for Growth: Sowing the Seeds of a Multidimensional Approach to Develop Reflective Practice

From this initial portrait, In the intermediate phase (2nd AR cycle), the PSTs struggle to grasp the essence of reflection became apparent. Recognizing this, the EF acknowledged the need to support the PSTs in recognizing their limitations in reflection. A key step in this process was the deconstruction and clarification of reflection concepts, particularly considering the challenges the PSTs faced during their practicum.

Through an in-depth examination of these concepts, and by addressing the PSTs' specific barriers, they began to unravel their prior misconceptions about reflection, leading to a more nuanced understanding and a shift in their initial views, as reflected in their realization: *'wait, so we weren't reflecting, but just stating'*. They also acknowledged that understanding the meaning of reflection would help enhance their teaching effectiveness: *'it could help me improve my lessons'*. This re-redefinition was evident in their questions regarding the incorporating of new elements into their reflections, such as *'thinking about other things'*.

While existing literature often highlights the importance of deconstructing and reconstructing experiences for effective reflection, it sometimes neglects the initial misconceptions of PSTs (Moore-Russo & Wilsey, 2014). Our approach addresses this gap by focusing on their initial understanding, thus offering a thorough view of their assimilation of fundamental reflection concepts. Accordingly, our findings suggest that a solid foundational understanding of reflection not only aids PSTs in grasping these concepts but also establishes a foundation for reevaluating their thinking their teaching-learning practices (Marshall, 2019; Moon, 2013). However, understanding the meaning of reflection involves self-analysis, an inherently intrusive process, leading the PSTs to sometimes adopt a defensive stance.

Accordingly, to counter the defensive attitudes of PSTs and establish a secure environment for them to recognize and confront their insecurities, the EF employed a caring approach characterized by vulnerability during the second AR cycle, as advocated by Eutsler and Curcio (2019). The humanizing effect of vulnerability, essential in building connections (Ostedgaard, 2022), was key to

this approach. By sharing personal experiences as a PST and actively participating in activities with them, the EF established a genuine and relatable rapport, as reflected in a PST's comment: *'After all, you look like one of us, and it's easier to talk to you. That gives me strength'*. This emotional support was pivotal, not only encouraging PSTs to share their thoughts openly but also fostering a willingness to engage in discussions with others.

Once trusting relationship was established, the EF could delve into the PSTs' personal worries and uncertainties related to their practice, thereby setting the stage for deeper interventions. In this supportive context, the PSTs were more open to understanding the essence of reflection and considering their actions and decisions reflectively. Our findings contribute to a central question in scientific research, underscoring the necessity of creating a nurturing and supportive environment conducive to reflective conversations (Luguetti et al., 2019).

However, during this phase of the AR cycle, the PSTs continued to uncritically accept and implement suggestions from their CT (i.e., thinking reproductively and adopting a dualistic perspective). Their analyses remained task-oriented, with cognitive efforts primarily devoted to metacognitive monitoring, such as evaluating criteria for executing students' motor skills and correcting students' motor performances.

Therefore, to encourage critical thinking and promote the understanding that every problem can have multiple solutions (i.e., intermediate reflection) (Zeichner & Liston, 1985), the EF employed various types of questions, specifically tailored to the specific challenges PSTs faced in their practice. Indeed, questioning is recognized as a key pedagogical approach for initiating the reflective process, particularly when it is tailored and relevant to the context (Tur et al., 2016).

For example, through probing questions, the EF provoked doubt, prompting PSTs to consider alternative solutions and to scrutinize their practices and decision-making more critically (i.e., adopting a relativist perspective) – as one PST reflected: *'I'm working out how to solve it'*. The insightful nature of these questions - what, how, when, and why – was essential for PSTs to reinterpret and

refine their instructional approaches. These questions acted as a catalyst, aiding PSTs in gaining a deeper understanding and more effectively modifying their teaching strategies to suit their class's specific characteristics. This endeavour, while not elevating PSTs to a critical level of reflection, helped them progress to an intermediate level. The PSTs began to question their teaching practices, integrating knowledge from previous curricular units and their understanding of the classroom context, marking a significant advancement towards critical reflection: *'Now I'm teaching a class, and I think, okay, I've learned to demonstrate the learning task this way, but now I wonder if it is the best way to do it for this class or not.'*

Our study reveals that tailored questioning within an AR context enabled PSTs begin to develop their critical thinking, which aligns with Chan and Lee's (2021) assertion that providing structured support and scaffolding is essential for fostering learner autonomy.

However, during this AR cycle, PSTs predominantly engaged in reflection-on-action, analyzing their pedagogical interventions post-occurrence. As one PST reported, temporal distance was needed for reflection, affording *'thinking material'* for interpreting their practice. This aligns with Chen (2023) observation that novice teachers often reflect on action.

To address this challenge, the EF proposed the strategy of peer observations and subsequent written reflections. While peer observations helped PSTs confront insecurities and objectively examine their pedagogical interventions, written reflections enabled them to construct well-founded arguments about their practices and engage in reflecting-in-action, considering how to act in similar situations.

These combined strategies strengthened the PSTs' critical thinking, a key requirement for reflection-in-action (Schön, 1987). Namely, these strategies improved the PSTs' ability to discern the what, how, and why of their actions, prompting informed decisions during lessons (i.e., reflection-in-action): *'I thought that I had to change something immediately'*, fostering a deeper and more practical reflection on their pedagogical interventions *'I need to see if they had*

really noticed what the idea of the task was. So I interrupted the task and explained it again. I am responsible for this'.

This integration of strategies by the EF not only deepened the PSTs' understanding of their own pedagogical intervention (i.e., intermediate reflection) but also enabled them to adapt their methods in real-time, thereby advancing their proficiency in reflection-in-action.

While much literature emphasizes tools for fostering teachers' reflection (Hammersley-Fletcher & Orsmond, 2005; Mouraz et al., 2022) and understanding personal experiences (Batlle, 2023), the predominant focus has been on tools that encourage 'reflection-on-action' (Umutlu & Kim, 2020), with lesser emphasis on reflection during action (i.e., reflection-in-action).

However, despite progressing in understanding reflection concepts, expressing thoughts, doubting and reflecting in action (i.e., intermediate reflection), PSTs still faced challenges in achieving a critical level of reflection, particularly regarding themselves and not just the teaching-learning process.

Reaping the Harvest: Yielding Growth from the Seeds of a Multidimensional Approach to Develop Reflective Practice

In the final stage (3rd AR cycle), the EF noted that, while the PSTs were aware of the challenges of critical reflection, they had not yet fully grasped its importance for developing self-awareness. This was apparent in their reflections, which often omitted considerations of others and contextual factors. To address this issue, the EF focused on establishing a connection between the PSTs' theoretical knowledge (i.e. reflection concepts) with the practical dilemmas and challenges they encountered in their teaching-learning practices.

This process aimed to illustrate the practical application of theoretical knowledge. For example, the EF encouraged the PSTs to discuss specific events documented in their RJs, a strategy that proved instrumental in helping PSTs attain an advanced awareness of critical reflection. This approach shifted their focus from merely theoretical understanding to developing personal interpretation anchored in the specific challenges of their teaching practice, thereby fostering practical application: *'I don't blame everyone and everything now, I know that*

above all, I am the one steering the ship, so I assume my decisions'.

Recent research has emphasized the value of a situated perspective on reflection. However, the development of reflection among PSTs has often been limited to portfolio work, without the benefit of individualized guidance or additional support (Chye et al., 2021). In our study, the individualized support facilitated the PSTs' ability to incorporate considerations of self, others, and context when analyzing issues. This led them to make deliberate choices based on rational thinking and methodical approaches: *'I don't blame everyone and everything now, I know that above all, I am the one steering the ship, so I assume my decisions (...)'.*

However, at this stage, PSTs continued to exhibit apprehension about exposing their weaknesses and the perceived inability to improve, both of which are essential for critical action and recognizing learning challenges and opportunities (Slepcevic-Zach & Stock, 2018).

Therefore, rather than adopting a 'one size fits all' approach (Chesterfield et al., 2010), the EF tailored her approach to the unique characteristics of each PST. Specifically, the EF's caring actions included teaching strategies centered on learners, which encouraged PSTs to engage more deeply in their thinking (Mesquita et al., 2015; Mesquita et al., 2023), thereby enhancing self-reflection. For example, to create opportunities for the PSTs to express themselves authentically, the EF asked them to make immediate audio recordings after their teaching sessions (Bergman, 2015) as a means of avoiding public scrutiny.

While caring is recognized as crucial in teacher education, prior research in teacher education (Simel Pranjić, 2021) suggests that reflection can either enhance (Schwind & Manankil-Rankin, 2020) or aid in understanding emotions (Ugalingan et al., 2022). However, there remains a gap in linking the mechanisms underlying caring and the processes of reflection. Our research revealed that the established sense of closeness could be instrumental in fostering critical thinking among PSTs, empowering them to embrace vulnerability, acknowledge their weaknesses, and identify challenges in their pedagogical practices. These findings align with those of Chen et al. (2018) in the context of nursing education,

demonstrating that a caring environment is conducive to developing critical thinking skills.

Although the PSTs developed personal interpretations of reflection and actively engaged in the reflective process, they continued to face challenges in providing explanations and justifications for their actions and incorporating the influence of the self in their reflections. In response, during this final stage, the EF used procedural next-step questions to encourage PSTs to explore various action possibilities (Paoletti et al., 2018). These questions prompted the PSTs to consider multiple perspectives and implications in their explanations, indicating progression towards critical reflection: *'to consider the whole and not just the sum of all parts, I mean, my equation has to include me, the students, the weather conditions, and other factors beyond my control'*.

Moreover, to help PSTs to explain and justify how their values, beliefs, and knowledge influenced their teaching (i.e., the influence of the self), the EF emphasized procedural next-step questions. This approach led PSTs to see their analysis of practice and actions as integral parts of the broader context, marking the beginning of their journey into critical self-reflection. Such an approach promoted critical analysis and reflection, contrasting with traditional pre-standardized checklists (Madin & Swanto, 2019). The EF's flexibility in adapting questions to meet the challenges faced by PSTs enabled them to critically evaluate and understand their experiences and make informed decisions.

While the PSTs had previously mastered reflect-in-action, advancing towards critical reflection posed a new challenge: the need to confront past struggles in reflecting on specific topics, particularly on reflection-in-action itself.

To enhance PSTs' awareness of changes in their teaching-learning practices, the EF persisted in advocating for written reflection, albeit with a revised focus. This change aimed to facilitate PSTs' reevaluation and reformulation of their ideas, thereby encouraging critical reflection on their prior thoughts. Supported and structured written reflection allowed PSTs to pause and reconsider their initial written reflections, leading to more profound insights.

Concurrently, through peer observation, PSTs gained the '*mental space*' needed to discern key elements in analyzing their peers' practices.

Contrary to traditional evaluative methods, these pedagogical strategies adopted an inclusive and constructive approach, enabling PSTs to continually self-evaluate and reassess their pedagogical practices. This finding contrasts with Zhang et al. (2023), who revealed that when PSTs are encouraged to reflect-in-action for assessment purposes, they may resort to false or compensatory reflection towards the end of the design process. Some PSTs even engage in insincere reflection to gain approval from their supervisors (Suphasri & Sumalee, 2021)

By the conclusion of the three stages in their reflective journey, the PSTs had established practical frameworks for understanding their roles and autonomously analyzing their practices. They gained new perspectives, allowing them to assess their actions within a broader context and effectively integrate and justify their past viewpoints with more recent reflections, culminating in a deeper and more comprehensive level of reflection.

However, despite notable advancements in critical reflection among PSTs, our findings reveal that progress was inconsistent within the group, with some PSTs still struggling to reflect on various nuances of critical reflection. For example, some PSTs encountered difficulties in fully integrating their knowledge of critical reflection into their teaching practice, particularly regarding the delegation of responsibilities to students and incorporating their feedback. Similarly, other PSTs struggled with the notion that their personal traits could significantly impact their classroom effectiveness, as evidenced by comments like: '*It is tough to grasp the idea that everything depends on you*'. Additionally, some PSTs found it challenging to apply their newly acquired insights into practical teaching scenarios, admitting: '*I mean, I am well aware of that stuff, but I am not sure that I can actually implement it.*'

This diversity highlights the need for more personalized and flexible teaching strategies to support reflective practice that caters to diverse reflective paths.

Overall, our research suggests that the dynamic and multifaceted interplay

among the dimensions of reflection, as revealed in each empirical study, not only substantiates the development of critical reflection among PSTs but also enriches our understanding of how to nurture and support it. It is the synergy and reciprocal influence of these studies that enhance our comprehension of the central aim. Each domain, by intertwining with others, contributes in a complementary manner to the development of PSTs' critical reflection, framed in self-awareness. This highlights how different aspects of reflection reinforce and refine each other throughout their reflective journey.

Beyond that, the findings underscore the significant role of the EF in cultivating critical reflection. The process, following an intentional, interactive, cyclical, contextual, and interventionist design (Lewin, 1946), enabled the EF to provide continuous and personalized support. This approach provides valuable insights for PETE programs.

Therefore, PETE programs should focus on preparing teacher educators to assume the role of the EF effectively. This preparation is crucial in assisting PSTs to develop their reflective abilities during their practicum in PE. Developing reflective skills is essential for PSTs, and their progression in this area requires active involvement rather than mere reliance on what their CTs say. Instead, teacher educators can facilitate this shift from dependence to autonomy, guiding PSTs to understand and independently navigate the challenges they encounter during their practicum.

4.2 Synopsis of the main findings

From the collective findings presented in this thesis, the following key overarching considerations can be highlighted:

- The main finding of this research lies in the enriched understanding provided by an AR design. Its innovative, intentional, interactive, cyclical, contextual, and interventionist characteristics facilitated strategic action planning, monitoring of changes, and the reflection on results. This methodology enabled the EF to provide continual, personalized support, pivoting on two key factors: (i)

the specific challenges encountered by PSTs and (ii) the progression of PSTs' reflective abilities over time.

- The EF's role in deconstructing reflection concepts through PSTs' meaningful experiences, particularly during their practicum, was a catalyst in enhancing their comprehension of the reflection process. This approach encouraged PSTs to scrutinize their actions and decisions within real-world contexts, thereby imbuing these concepts with tangible meaning and advancing their capacity to apply them critically and intentionally in their teaching-learning activities.

- The implementation of tailored caring strategies by the EF, designed to meet the challenges of practicums and aligned with the individual reflective needs and capabilities of PSTs, was essential for fostering their critical reflection. This approach involved the development and application of varied caring strategies, focusing on their application in demanding environments like practicums, and formulating specific approaches to meet the diverse demands of PSTs.

- The incorporation of diverse questions, specifically tailored by an EF to align with PSTs' situated experiences and their current level of reflection, proved to be a valuable strategy. This approach enhanced PSTs' analysis of multiple perspectives and heightened their awareness of their own influence within their teaching-learning practices (i.e., critical reflection).

- The combination of peer observation with written reflections was instrumental for PSTs in gaining a deeper understanding of their personal challenges and the necessity to seek new and improved solutions. This process allowed them to engage in action-oriented reflection, re-evaluate their prior reflections, and reinforced the recognition of the necessity search for new and better solutions.

4.3 Practical applications for PETE programs

In consideration of the research design adopted and the findings obtained, this thesis offers various practical recommendations for PSTs, novice teachers, in-service teachers, and all involved stakeholders in PETE.

- The research indicates that supervisors or CTs, when provided with adequate training and resources, can serve as EFs. For successful facilitation, it would be beneficial for CTs to explore diverse professional learning opportunities. These could include specialized training programs, self-directed educational initiatives, mentorship from experienced peers, collaboration with educational EFs, and the use of technological tools to facilitate structured reflection.
- PETE programs should focus on cognitive activities like critical analysis, synthesis, and evaluation, promoting a questioning approach towards current and future practices. This approach is essential in guiding PSTs towards critical reflection. Interpreting real-world practices at various moments is key to developing PSTs' critical thinking skills, fostering a deeper evaluation of experiences and challenges. Such an approach encourages them to consider multiple perspectives and make more informed pedagogical decisions.
- Critical reflection hinges on the interaction between the content, processes, and aims of PSTs' actions, as well as various reflective moments. Consequently, it is suggested for PETE programs to nurture an open-minded attitude among PSTs. Such an approach expands the range of potential solutions and responses to the practical challenges they encounter. This encourages a more dynamic and flexible approach to problem-solving and pedagogical decision-making.
- Finally, PETE programs are encouraged to implement a dynamic combination of strategies, including caring strategies, questioning, peer observation, and written reflection. These strategies should be continuously applied during practicums and be tailored to suit the varying levels of reflection

and individual needs of PSTs. This ensures a more effective, personalized training process, facilitating the development of reflective capabilities in PSTs.

4.4 Suggestions for future scientific research

As stated at the outset of this thesis, there exists a need for further longitudinal research, given the dynamic and complex nature of reflection and teaching environments. Future research recommendations are not only aimed at filling gaps identified in current literature but also at enhancing the depth and practical relevance of PETE programs.

Future studies should concentrate on the practical 'how-to' aspects, assisting PSTs in gaining deeper insights into their practices and improving them. Such research could effectively bridge the divide between theoretical knowledge of reflection and the actual needs of PSTs during their practicum. This would enable supervisors or CTs to understand the practice-related challenges PSTs encounter and to offer more personalized support.

The rapid evolution of digital technologies opens new opportunities for enhancing PSTs' reflective practices. Research into the effectiveness of e-learning platforms and online forums in facilitating critical reflection is imperative. In today's increasingly digital educational landscape, understanding how these technologies can be leveraged to deepen PSTs' reflective thinking is vital. Such studies could yield valuable insights into how digital tools can be used to foster a reflective mindset, meeting the evolving demands of the education sector. For example, incorporating visual data, like images and videos, in research could offer a more intricate understanding of the dual role of the researcher and EF. This method provides a comprehensive and precise portrayal of the dynamics of teaching-learning and the reflective process. It allows for the exploration of nuances in interactions and pedagogical approaches that might be overlooked in traditional qualitative analyses. Implementing this approach could result in the development of more sophisticated strategies for enhancing reflective practice among PSTs.

4.5 References

- Battle, J. (2023, 2023/02/01/). Hosting collectivity: 'We' as a person reference in interactional reflective practice in peer observation sessions. *Linguistics and Education*, 73, 101147. <https://doi.org/https://doi.org/10.1016/j.linged.2023.101147>
- Bergman, D. (2015, 04//Apr-Jun2015). Comparing the Effects of Classroom Audio-Recording and Video-Recording on Preservice Teachers' Reflection of Practice [Article]. *Teacher Educator*, 50(2), 127-144. <https://doi.org/10.1080/08878730.2015.1010054>
- Chan, C. K., & Lee, K. K. (2021). Reflection literacy: A multilevel perspective on the challenges of using reflections in higher education through a comprehensive literature review. *Educational Research Review*, 32, 100376.
- Chen, J. J. (2023). Reflecting on reflection among early childhood teachers: a study of reflection for, in, and on action intersecting with the technical, practical, and critical dimensions. *Reflective Practice*, 1-23. <https://doi.org/10.1080/14623943.2023.2194624>
- Chen, S. Y., Chang, H. C., & Pai, H. C. (2018, 03//). Caring behaviours directly and indirectly affect nursing students' critical thinking [Article]. *Scandinavian Journal of Caring Sciences*, 32(1), 197-203. <https://doi.org/10.1111/scs.12447>
- Chesterfield, G., Potrac, P., & Jones, R. (2010). "Studentship" and "Impression Management" in an Advanced Soccer Coach Education Award. *Sport, Education and Society*, 15(3), 299-314. <http://search.ebscohost.com/login.aspx?direct=true&db=eric&AN=EJ893288&lang=pt-br&site=ehost-live>
<http://www.informaworld.com/openurl?genre=article&id=doi:10.1080/13573322.2010.493311>
- Chye, S., Zhou, M., Koh, C., & Liu, W. C. (2021, 2021/09/03). Levels of reflection in student teacher digital portfolios: a matter of sociocultural context? *Reflective Practice*, 22(5), 577-599. <https://doi.org/10.1080/14623943.2021.1937976>
- Dervent, F. (2015, 08//). The effect of reflective thinking on the teaching practices of preservice physical education teachers [Article]. *Issues in Educational Research*, 25(3), 260-275. <https://search.ebscohost.com/login.aspx?direct=true&AuthType=ip.shib.uid&db=eue&AN=109114386&lang=pt-pt&site=ehost-live&scope=site>
- Dorman, E. H. (2020, 09//). A CYCLE OF FRAGILITY: Prospective Teachers' Emotions and Perspectives Around Being Assessed and Evaluated [Article]. *Curriculum & Teaching Dialogue*, 22(1/2), 265-279. <https://search.ebscohost.com/login.aspx?direct=true&AuthType=ip.shib.uid&db=eue&AN=145153812&lang=pt-pt&site=ehost-live&scope=site>
- Eutsler, L., & Curcio, R. (2019). Private blog reflections connecting course content with field experiences: preservice teachers grapple with teacher identity. *Reflective Practice*, 20(2), 250-265.
- Greve, S., Weber, K. E., Brandes, B., & Maier, J. (2021). What Do They Reflect on?—A Mixed-Methods Analysis of Physical Education Preservice

- Teachers' Written Reflections After a Long-Term Internship. *Journal of Teaching in Physical Education*, 41(4), 590-600. <https://doi.org/https://doi.org/10.1123/jtpe.2021-0103>
- Hammersley-Fletcher, L., & Orsmond, P. (2005, 2005/04/01). Reflecting on reflective practices within peer observation. *Studies in Higher Education*, 30(2), 213-224. <https://doi.org/10.1080/03075070500043358>
- Larrivee, B. (2008). Meeting the challenge of preparing reflective practitioners. *The New Educator*, 4(2), 87-106. <https://doi.org/https://doi.org/10.1080/15476880802014132>
- Luguetti, C., Kirk, D., & Oliver, K. L. (2019, 2019/11/02). Towards a pedagogy of love: exploring pre-service teachers' and youth's experiences of an activist sport pedagogical model. *Physical Education and Sport Pedagogy*, 24(6), 629-646. <https://doi.org/10.1080/17408989.2019.1663499>
- Madin, C. V., & Swanto, S. (2019). An inquiry approach to facilitate reflection in action research for ESL pre-service teachers. *TEFLIN Journal*, 30(1), 1-21.
- Marshall, T. (2019). The concept of reflection: a systematic review and thematic synthesis across professional contexts. *Reflective Practice*, 20(3), 396-415. <https://doi.org/https://doi.org/10.1080/14623943.2019.1622520>
- Mesquita, Coutinho, De Martin-Silva, L., Parente, B., Faria, M., & Afonso, J. (2015). The value of indirect teaching strategies in enhancing student-coaches' learning engagement. *Journal of Sports Science & Medicine*, 14(3), 657.
- Mesquita, I., Farias, C., De Martin Silva, L., Afonso, J., & Coutinho, P. (2023, 2023/01/02). How Can Learner-Oriented Scaffolding Strategies Be Implemented in Coach Education? A Case Study. *Research Quarterly for Exercise and Sport*, 94(1), 216-225. <https://doi.org/10.1080/02701367.2021.1961994>
- Moon. (2013). *Reflection in learning and professional development: Theory and practice*. Routledge. [https://www.google.com/books?hl=pt-PT&lr=&id=8y0LwQxZUf4C&oi=fnd&pg=PR2&dq=Moon.+\(2013\).+Reflection+in+learning+and+professional+development:+Theory+and+practice.+Routledge.+&ots=1t2BAAtQPhS&sig=tidtwL09bbmp1fmGZzykbvDKcXg](https://www.google.com/books?hl=pt-PT&lr=&id=8y0LwQxZUf4C&oi=fnd&pg=PR2&dq=Moon.+(2013).+Reflection+in+learning+and+professional+development:+Theory+and+practice.+Routledge.+&ots=1t2BAAtQPhS&sig=tidtwL09bbmp1fmGZzykbvDKcXg)
- Moore-Russo, D. A., & Wilsey, J. N. (2014). Delving into the meaning of productive reflection: A study of future teachers' reflections on representations of teaching. *Teaching and Teacher Education*, 37, 76-90. <https://doi.org/https://doi.org/10.1016/j.tate.2013.10.002>
- Mouraz, A., Pinto, D., & Cristina Torres, A. (2022). Effects of a model for multidisciplinary peer observation of teaching in teacher professional development and in nurturing a reflective school. *Reflective Practice*, 1-14. <https://doi.org/https://doi.org/10.1080/14623943.2022.2130225>
- Ostedgaard, M. (2022). *Principals' Perspectives of Trust and Vulnerability in Leadership: A Grounded Theory Study* University of Denver].
- Paoletti, T., Krupnik, V., Papadopoulos, D., Olsen, J., Fukawa-Connelly, T., & Weber, K. (2018). Teacher questioning and invitations to participate in advanced mathematics lectures. *Educational Studies in Mathematics*, 98(1), 1-17.
- Schön, D. A. (1987). *Educating the reflective practitioner: Toward a new design*

- for teaching and learning in the professions.
<http://search.ebscohost.com/login.aspx?direct=true&db=psyh&AN=1987-97655-000&site=eds-live>
- Schwind, J. K., & Manankil-Rankin, L. (2020). Using narrative reflective process to augment personal and aesthetic ways of knowing to support holistic person-centred relational practice. *Reflective Practice*, 21(4), 473-483.
- Slepcevic-Zach, P., & Stock, M. (2018). ePortfolio as a tool for reflection and self-reflection. *Reflective Practice*, 19(3), 291-307.
- Standal, Ø. F., & Moe, V. F. (2013). Reflective practice in physical education and physical education teacher education: A review of the literature since 1995. *Quest*, 65(2), 220-240.
<https://doi.org/https://doi.org/10.1080/00336297.2013.773530>
- Suphasri, P., & Sumalee, C. (2021). Reflective Practice in Teacher Education: Issues, Challenges, and Considerations [Journal Article]. *PASAA: A Journal of Language Teaching and Learning in Thailand*, 62, 236-264.
<https://search.ebscohost.com/login.aspx?direct=true&AuthType=ip,shib&db=mlf&AN=EIS155413737&lang=pt-pt&site=ehost-live&scope=site>
- Tur, G., Marín, V. I., Moreno, J., Gallardo, A., & Urbina, S. (2016). From diagrams to self-regulated learning: student teachers' reflections on the construction of their PLE. *Educational Media International*, 53(2), 139-152.
- Ugalingan, G. B., Bautista, A. C., & Mante-Estacio, M. J. (2022, 04//). Pre-service teachers' reflection on their efficacy beliefs in conducting action research [Article]. *Reflective Practice*, 23(2), 266-278.
<https://doi.org/10.1080/14623943.2021.2014312>
- Umutlu, D., & Kim, C. (2020). Design guidelines for scaffolding pre-service teachers' reflection-in-action toward culturally responsive teaching. *Reflective Practice*, 21(5), 587-603.
<https://doi.org/https://doi.org/10.1080/14623943.2020.1779049>
- Zeichner, K. M., & Liston, D. (1985). Varieties of discourse in supervisory conferences. *Teaching and Teacher Education*, 1(2), 155-174.
- Zhang, Z., Bekker, T., Markopoulos, P., & Skovbjerg, H. M. (2023). Supporting and understanding students' collaborative reflection-in-action during design-based learning. *International Journal of Technology and Design Education*, 1-37. <https://doi.org/https://doi.org/10.1007/s10798-023-09814-0>