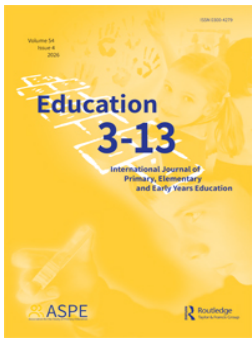




Game on! Enhancing teacher development in primary PE through a Rosenshine-inspired approach

Item Type	Article (Version of Record)
UoW Affiliated Authors	Pritchard, Rhys and Dockerty, Fran
Full Citation	Pritchard, Rhys and Dockerty, Fran (2026) Game on! Enhancing teacher development in primary PE through a Rosenshine-inspired approach. Education 3-13 International Journal of Primary, Elementary and Early Years Education, Latest. pp. 1-15. ISSN 0300-4279 Online: 1475-7575
DOI/ISBN/ISSN	https://doi.org/10.1080/03004279.2026.2655144
Journal/Publisher	Taylor and Francis Education 3-13 International Journal of Primary, Elementary and Early Years Education
Rights/Publisher Set Statement	© 2026 The Author(s). Published by Informa UK Limited, trading as Taylor & Francis Group This is an Open Access article distributed under the terms of the Creative Commons Attribution-NonCommercial-NoDerivatives License, http://creativecommons.org/licenses/by-nc-nd/4.0/
License	CC BY NC ND 4.0
Link	https://www.tandfonline.com/doi/full/10.1080/03004279.2026.2655144

For more information, please contact wrapteam@worc.ac.uk



Game on! Enhancing teacher development in primary PE through a Rosenshine-inspired approach

Rhys Pritchard & Fran Dockerty

To cite this article: Rhys Pritchard & Fran Dockerty (09 Apr 2026): Game on! Enhancing teacher development in primary PE through a Rosenshine-inspired approach, Education 3-13, DOI: [10.1080/03004279.2026.2655144](https://doi.org/10.1080/03004279.2026.2655144)

To link to this article: <https://doi.org/10.1080/03004279.2026.2655144>



© 2026 The Author(s). Published by Informa UK Limited, trading as Taylor & Francis Group



Published online: 09 Apr 2026.



Submit your article to this journal [↗](#)



Article views: 220




View related articles [↗](#)



View Crossmark data [↗](#)

Game on! Enhancing teacher development in primary PE through a Rosenshine-inspired approach

Rhys Pritchard and Fran Dockerty 

Institute of Education, University of Worcester, Worcester, United Kingdom of Great Britain and Northern Ireland

ABSTRACT

This study investigates how Rosenshine's (2012) Principles of Instruction can support trainee primary teachers in developing their teaching of physical education (PE). Twelve PGCE trainees on a PE specialism pathway participated in a Rosenshine-inspired immersion programme, combining theoretical input with practical application through games-based approaches. Data were collected via three focus groups and analysed using thematic analysis. Findings indicate that trainees valued Rosenshine's principles as a structured framework for lesson design and delivery, particularly in scaffolding, modelling and questioning. The integration of non-linear pedagogy and the STEP model enhanced independent practice and engagement. However, challenges emerged around curriculum planning, effective questioning and limited opportunities to teach PE during school placements. The study highlights the importance of sustained professional development and practical teaching opportunities to embed pedagogical strategies. Recommendations include prioritising PE teaching in initial teacher education and further research into questioning techniques and curriculum design.

ARTICLE HISTORY

Received 8 January 2026
Accepted 24 March 2026

KEYWORDS

Rosenshine; primary physical education; teacher education; professional development; pedagogical content knowledge

Introduction

In Pritchard and Dockerty (2024), we explored how Rosenshine's (2012) Principles of Instruction could be meaningfully applied to Primary Physical Education (PPE) through a games-based approach (GBA). That paper aimed to support generalist primary teachers in transferring effective classroom pedagogy into the PE setting, offering practical strategies grounded in both theory and experience. Building on that foundation, this paper aims to explore PE specialist trainees' teacher development in PPE and how Rosenshine's principles were used as a framework to support development. These trainees are still predominantly trained as classroom practitioners; however, they have an adapted curriculum to incorporate more PE content to facilitate the specialism. By advancing the conversation and using empirical data, we aim to further support the development of teaching practice in PPE and contribute to the ongoing discourse around sustainable, high-quality PPE provision in schools.

A consistent criticism of the primary setting has been primary generalist teachers' lack of training and low levels of confidence in being able to deliver high-quality PPE (Clohessy, Bowles, and Ní Chróinín 2020; Jess, McEvilly, and Carse 2017; Lynch and Soukup 2017; Spittle, Spittle, and Itoh 2022). In England, 50% of trainee teachers are not getting the opportunity to teach PPE in teaching

CONTACT Rhys Pritchard  rhys.pritchard2@worc.ac.uk; f.dockerty@worc.ac.uk

© 2026 The Author(s). Published by Informa UK Limited, trading as Taylor & Francis Group
This is an Open Access article distributed under the terms of the Creative Commons Attribution-NonCommercial-NoDerivatives License (<http://creativecommons.org/licenses/by-nc-nd/4.0/>), which permits non-commercial re-use, distribution, and reproduction in any medium, provided the original work is properly cited, and is not altered, transformed, or built upon in any way. The terms on which this article has been published allow the posting of the Accepted Manuscript in a repository by the author(s) or with their consent.

practices due to a growing outsourcing culture of employing lower-qualified and cheaper alternatives (Randall 2022). This culture is also reflective further afield in countries such as New Zealand, Australia and Ireland, which has consequently deskilled the teaching profession within primary, highlighting an international issue (Dyson et al. 2016; Mangione et al. 2020; Ní Chróinín and O'Brien 2019; Sperka and Enright 2018).

Rather than going over old ground, moving the profession forward by addressing the lack of training and professional development seems important. Initial findings in the second author's PhD project have indicated more of a shift towards generalists teaching PPE, emphasising the importance of developing teacher and trainee practice. Having received 50 questionnaire responses from subject leaders of PPE, the data reported that 48% of schools engaged in a 'generalist plus one' model, indicating that the generalist teacher was assisted by either a sports coach, subject specialist or subject leader. Additionally, 30% of schools in the sample have a generalist-only model. Therefore, in this small sample size, 78% of generalist teachers were teaching PE. Although we acknowledge that the locality and small data set will influence this, the data indicate that generalists have more opportunities to teach PPE. Therefore, the need to provide more support to generalist and specialist PPE primary teachers and trainees is even more prevalent to support the ongoing provision of high-quality PE.

Effective professional development (PD) provides opportunities for primary generalist teachers to develop their pedagogical practices in PE. Morgan et al. (2019, 43), in their conceptualisation of professional collaborative learning, state that PD should be '*supportive, job embedded, instructionally focused, collaborative and ongoing*'. Morgan et al. (2019) offer their model for developing teacher practices in PE by encouraging teachers to transfer their positive classroom pedagogy to the PE environment. Indeed, Rosenshine (2012) provides teachers with a set of common principles that can be enacted across all classroom-based subjects; however, only recently have the principles been considered and applied to the field of PPE (Pritchard and Dockerty 2024). The benefit here for teachers is that they can focus on applying subject knowledge to already familiar principles, as opposed to having to engage with a subject-specific pedagogical approach. This alludes to the importance of Pedagogical Content Knowledge (PCK), that is, the ability to integrate both content expertise and pedagogical skill (Shulman 1986).

Shulman (1986) introduced PCK as a distinctive form of teacher expertise that goes beyond knowing subject matter or general pedagogy in isolation. This means that what makes an expert teacher is not simply knowing what to teach but knowing how best to teach it. Ward and Kim (2024) demonstrate how PCK is imperative to PE teacher education with its importance of integrating content, pedagogy, context and learner knowledge. Its importance has been recognised globally, with Shulman (1986) directly referenced in New Zealand's Health and Physical Education Framework as its underpinning framework (Ministry of Education New Zealand 2024).

We propose that integrating Morgan et al.'s (2019) collaborative model with Rosenshine's principles (2012) offers a powerful framework for developing trainee teachers' pedagogical practice in PE, facilitating the transfer of effective classroom pedagogy into the PE environment. Therefore, in this study, the aim of the research was to explore how primary trainee teachers develop their pedagogical expertise in PPE through the application of Rosenshine's principles of instruction. The aim was addressed through two interrelated objectives:

- (1) To explore trainees' application of Rosenshine-informed pedagogy in PPE.
- (2) To investigate how trainees' confidence and competence developed over time.

In terms of structure, following this brief introduction, we reintroduce Rosenshine's (2012) ten principles of instruction. After this, the methodology is presented, followed by the results and discussion that aim to capture and discuss the key findings. The article concludes with a summary of the principal findings and considerations for future directions.

Rosenshine

Rosenshine's principles of instruction (2012) come from three areas: (1) research in cognitive science, how brains acquire and use information, (2) research on master teachers, those whose classrooms made the highest gain on achievement tests and (3) research on cognitive supports to help students learn complex tasks. The principles of effective instruction below were derived from these sources (for more detail on their suggested application to GBA in PPE, see Pritchard and Dockerty 2024):

- (1) Begin a lesson with a short review of previous learning.
- (2) Present new material in small steps with student practice after each step.
- (3) Ask a large number of questions and check the responses of all students.
- (4) Provide models.
- (5) Guide student practice.
- (6) Check for student understanding.
- (7) Obtain a high success rate.
- (8) Provide scaffolds for difficult tasks.
- (9) Require and monitor independent practice.
- (10) Engage students in weekly and monthly reviews.

(Rosenshine 2012, 12)

Methodology

This study adopts a qualitative research design situated within an interpretivist paradigm, underpinned by a relativist ontology and a constructivist epistemology. This philosophical orientation acknowledges that knowledge is socially constructed and context-dependent, and that the experiences of trainee teachers are best understood through their own interpretations and reflections (Marshall, Quennerstedt, and Almqvist 2024). The research aims to explore how PGCE primary trainees develop their pedagogical practice in PE through the application of Rosenshine's principles of instruction.

Participants

The participants were 12 PGCE students (8 male and 4 female trainees) who were on the PPE Specialist route at the author's university. They were purposively selected due to being on the specialist pathway, therefore being the only group who would be immersed in Rosenshine's principles of instruction in PPE because of having more PE curriculum time on their PGCE. All trainees studied a sports-related undergraduate degree, providing them with a more in-depth knowledge and understanding of PE and sport-related practices.

Ethical considerations

Ethical approval for this study was granted by the University of Worcester's Research Ethics Committee. All participants were provided with detailed information sheets outlining the purpose, procedures and voluntary nature of the study. Informed consent was obtained in writing prior to participation.

Participants were assured of their right to withdraw from the study at any point without penalty and were informed that their data would be anonymised and treated confidentially. Pseudonyms were used in all transcripts and reporting to protect participant identity. Audio recordings and transcripts were securely stored in accordance with the university's data protection policies and the UK General Data Protection Regulation (GDPR).

The research design was sensitive to the power dynamics inherent in educational research, particularly given the dual role of the researcher as a lecturer. To mitigate this, participation was voluntary, and students were reassured that their involvement – or decision not to participate – would have no bearing on their academic progress. The first author's only involvement with the trainees' PGCE journey was through these focus groups, and the second author did not participate in the focus groups, enabling the trainees to talk freely about their experiences without fear of judgement.

Rosenshine immersion: context and design

The intervention, referred to as the 'Rosenshine Immersion', was strategically positioned between the trainees' first (SE1) and second (SE2) school placements ([Figure 1](#)). This timing was intentional, allowing trainees to reflect on their classroom teaching experiences and consider how effective pedagogical strategies could be transferred into the PPE context. Prior to trainees experiencing the Rosenshine Immersion, they had developed their theoretical and practical understanding of Non-Linear Pedagogy (NLP) and a range of GBA's, including Teaching Games for Understanding (TGfU), Game Sense and Tactical Games Approach (TGA), through previous seminars in the initial phase of the PGCE programme. In total, the Rosenshine Immersion spanned 6 h of direct contact between the lecturer and trainees.

Within the English context, where this study takes place, Rosenshine's principles of instruction are widely recognised as core professional reading across ITE. Consequently, trainees had encountered Rosenshine's (2012) work across multiple modules, including professional studies and subject-specific curriculum seminars. Therefore, the Rosenshine Immersion began with a seminar in which trainees revisited Rosenshine's ten principles of instruction (Rosenshine 2012), building on (1) their prior exposure to the PGCE and (2) their understanding of NLP and GBA's developed in the initial phase. Trainees were encouraged to reflect on their strengths from SE1 and identify specific Rosenshine-aligned strategies they had used in the classroom. The lecturer framed the subsequent discussion around how principles in classroom-based subjects could be meaningfully translated into a PPE context.

The core of the immersion involved a practical handball session, where the lecturer modelled deliberate teaching behaviours aligned with Rosenshine's principles. For example:

- **Principle 1: Reviewing prior learning** – Trainees recalled and demonstrated handball throws from a previous session.
- **Principle 2: Presenting material in small steps** – The lecturer paused small-sided games (3v3) to introduce one development point at a time. The initial focus was on the fundamental movement skill (FMS) of dribbling, which was then progressively refined throughout the session. Small, progressive steps included dribbling with one hand and the application of handball-specific dribbling rules, such as players only taking three steps before dribbling.
- **Principle 4: Modelling** – The lecturer froze play to have trainees re-enact a successful passage of play in slow motion, narrating the sequence and then repeating it in real time. Observing trainees

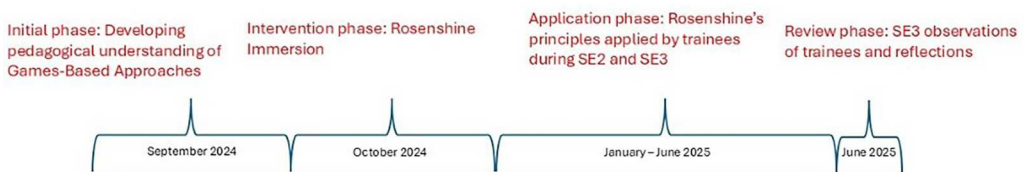


Figure 1. Visualisation of the development programme.

were then asked to move to a different viewpoint to gain a new perspective on the passage of play, which supported understanding of the attacking and defensive positioning.

- **Principle 7: Obtain a high success rate** – The lecturer adapted the game through the STEP principle (space, task, equipment and people). The STEP model is a framework used to adapt and adapt activities by modifying Space, Task, Equipment and People to ensure inclusive and effective learning (López-Pastor et al. 2013). For example, to emphasise creating space in an attacking phase, the lecturer created designated channels on the sides of the area for selected players to move through. Such modifications to the games promoted greater space in the central areas and encouraged players to exploit the wide areas when attacking. This modification ensured tactical awareness and decision-making were developed while creating variability within the same environment, supporting the attacking team to achieve high levels of success.
- **Principle 9: Require and monitor independent practice** – The lecturer allowed time and space to observe trainees in their Handball activity, allowing them the opportunity to practice the dribbling and throwing skills in a game scenario. During the games, the lecturer engaged with trainees through quick interactions, stepping in at appropriate times to challenge their thinking. For example, asking how an attacker might communicate with their teammate to receive the ball without alerting the defender.

Following the practical, trainees received a resource based on Pritchard and Dockerty (2024), which outlined how each principle could be operationalised in PPE (Figure 2). They were able to use the resource as a framework to identify which of the principles were deliberately modelled by the lecturer. The discussion focused on the effectiveness of each deliberate behaviour in the teaching of the activity, with the lecturer posing questions to trainees, further emphasising the importance of questioning (principle 3). An evaluative discussion provided an opportunity for the trainees and the lecturer to co-construct conclusions about the effectiveness of modelled behaviours, identify missed opportunities during the practical to exaggerate other principles and reflect collectively on how the behaviours might be refined in practice with their learners.

Trainees were then tasked with designing their own PE activity in any area of the primary curriculum, focusing on the deliberate pedagogical behaviours of the teacher, explicitly aligned with a chosen Rosenshine principle. The task was undertaken collaboratively in small groups, with each group demonstrating their activity to the wider cohort, engaging in peer-led collaboration that deepened their immersion into Rosenshine's principles. Once the practical activities were completed, the final part of the session consisted of a discussion that centred around the application of the framework in wider areas of the PPE curriculum. The Rosenshine resource was used as a framework during the remaining PPE specialism seminars on the PGCE course, emphasising its application to different areas of the PPE curriculum.

After completing the immersion session, trainees were tasked with applying Rosenshine's principles during their remaining two school experience (SE) placements during the application phase of the programme. Trainees and SE mentors were provided with the Rosenshine resource, ensuring that each of their subsequent PPE lessons on placements was supported by this framework. With the expectation of teaching three PPE lessons per week across the rest of their placements, trainees had ample opportunities to apply Rosenshine's principles to their practice in the months that followed.

The review phase consisted of visits to placement schools, where trainees were observed in teaching PPE. This took place during the final stage of trainees' PGCE course, where they were assessed against the Teacher Standards in all aspects of the primary curriculum (Department for Education 2021). Therefore, in their observations by the lecturer, the Rosenshine resource was used as a point of reference, rather than an assessment framework. The trainees and lecturer then engaged

Applying Rosenshine's Principles of Instruction to PE

1) Begin a lesson with a short review of previous learning.




- Start with small sided games, revisiting skills and tactics from previous lesson through a game question and answer model.
- In gymnastics and dance, provide initial opportunity for movement exploration whilst questioning children.


Rosenshine's Principles of Instruction

Taken from [Rosenshine \(2012\)](#):

- 1) Begin a lesson with a short review of previous learning.
- 2) Present new material in small steps with student practice after each step.
- 3) Ask a large number of questions and check the responses of all students.
- 4) Provide models.
- 5) Guide student practice.
- 6) Check for student understanding.
- 7) Obtain a high success rate.
- 8) Provide scaffolds for difficult tasks.
- 9) Require and monitor independent practice.
- 10) Engage students in weekly and monthly review.



2) Present new material in small steps with student practice after each step.



- Teach a new skill or movement in isolation before combination.
- Provide only one developmental point at a time when giving feedback so not to cognitively overload children.
- Utilise small sided games, to allow children to practice skills in a more accessible game scenario

Key Reading:


- 1) Light (2013), Almond (2015), Mitchell, Griffin and Oslin (2013).
- 2) Vygotsky (1987), Light (2013), Mitchell et al (2013)

3) Ask a large number of questions and check the responses of all students




- Ask children to freeze during an activity before asking them a leading question to initiate interaction
- Create a success criteria with children to generate questions for peer-to-peer feedback
- End each activity or lesson with questions.

4) Provide models.



- Be aware of the location of your lesson and ensure that all children can see a demonstration and hear the verbal cues.
- Model from different angles
- Model at different speeds, slowing down demonstrations at key moments.

5) Guide student practice. 6) Check for student understanding. 8) Provide scaffolds for difficult tasks.



- Provide the children with time to practice
- Allow yourself time and space to observe
- Interact with children as they practice
- Generate a shared vocabulary and success criteria

7) Obtain a high success rate.



- Adapt the activity using the STEP principle* to ensure a high success rate
- Create variability in the environment
- Involve children in the creation of activities

*STEP Principle: Adapt, differentiate and extend by manipulating Space, Task, Equipment or People

9) Require and monitor independent practice.



- Allow opportunity to practice skills or movement in isolation and in groups
- Engage in short, quick interactions providing instant feedback
- Practise, assess and improve skills and apply to a variety of scenarios

10) Engage students in weekly and monthly review.



- Design your curriculum so it focuses on transferrable skills, providing children with a range of experiences whilst allowing them to review and practise these skills frequently.
- Continuously make connections between contexts

Key Reading:

- 3) Daniels (2001), Pritchard and Morgan (2022), Kerriganis and Pili (2017).
- 5,6,8) Englin (2014), Karpov (2014), Morgan et al (2017).
- 9) Rosenshine et al (2019), Kalaja et al (2011)

Key Reading:

- 4) Rink (1994), Pili and SueSee (2017), Ryan, Maina and Mokgwathi (2016).
- 7) Oslin et al (2013), Renshaw, Davids, Newcombe and Roberts (2019), Deci and Ryan (1985).
- 10) Vygotsky (1978, 1987), Rosenshine (2012).

Figure 2. Rosenshine's principles resource.

in professional development discussions, considering how Rosenshine's principles had been applied in their teaching and how they could be further developed in the future.

Methods of data collection

To capture the depth and nuance of trainees' experiences, the study employed focus groups as the primary method of data collection. Focus groups were selected for their ability to generate rich, dialogic data through participant interaction, enabling the co-construction of meaning and the surfacing of shared and divergent experiences (Krueger and Casey 2015).

Three focus groups were conducted, each comprising four PGCE PPE trainees. The groups were purposefully composed to ensure a diversity of perspectives while maintaining a manageable size for in-depth discussion. Each session was facilitated by the first author and took place in a familiar university setting to promote comfort and openness.

Focus groups took place after the final school placement, lasting between 25 and 35 min and were guided by a semi-structured protocol that encouraged participants to reflect on:

- Their general experience with Rosenshine’s principles
- Application of Rosenshine’s Principles in PE
- How their pedagogical understanding and application improved because of applying Rosenshine’s Principles
- Future Applications and Reflections

All focus groups were audio-recorded and transcribed verbatim to ensure fidelity to participants’ voices and to support rigorous analysis.

Data analysis

Data were analysed using Braun and Clarke’s (2022) six-phase reflexive thematic analysis, a flexible and widely used method for identifying, analysing and reporting patterns within qualitative data. This study looked at applying Rosenshine’s Principles of Instruction, framing initial analysis as deductive in nature. Deductive analysis is driven by a theoretical interest and, rather than providing a rich description of data, it is more of a detailed analysis of some aspects of the data (Braun and Clarke 2022). This was supported by an inductive analysis, allowing other themes to be actively produced from the data rather than being pre-determined by existing theory.

The six phases of analysis included:

- (1) **Familiarisation** – The researchers immersed themselves in the data by reading transcripts multiple times, noting initial impressions and recurring ideas.
- (2) **Generating Initial Codes** – Meaningful segments of data were coded line-by-line, capturing key features relevant to the research questions.
- (3) **Searching for Themes** – Codes were grouped into broader themes that reflected patterns across the dataset, such as ‘transferring classroom strategies’, ‘confidence in PE’ and ‘modelling and scaffolding’.
- (4) **Reviewing Themes** – Themes were refined to ensure coherence and distinctiveness, with some being merged, split or discarded based on their relevance and clarity.
- (5) **Defining and Naming Themes** – Each theme was clearly defined and named to capture its essence and contribution to the research aims.
- (6) **Writing the Report** – The final phase involved constructing a rich, analytic narrative supported by illustrative quotes, linking the findings back to the research questions and relevant literature.

Throughout the analysis, reflexivity was maintained, with the researcher critically reflecting on their role in interpreting the data and the potential influence of their own experiences and assumptions (Braun and Clarke 2022).

Results and discussion

Following data analysis, two broad themes were generated. The first theme explored the Understanding of Rosenshine’s Principles as a core framework. The second theme addressed its practical application in their teaching in PE and some of the challenges faced. The second theme has far greater weighting in this section, which is to reflect the analytical emphasis of the findings.

Application of Rosenshine's principles of instruction

During all focus groups, the trainees recognised the value of using Rosenshine's principles and that its introduction and subsequent revisiting supported with developing their growth and teaching of PE.

Introduction and understanding of Rosenshine's principles as a core framework

As detailed in the methodology, the trainees were methodically introduced to Rosenshine's Principles of Instruction as a core component of their PE teacher training. Although having studied PE or sport as undergraduate students, the trainees had little or no familiarity with Rosenshine before the course:

Trainee 1: I think on undergrad we sort of looked at the principles that come under Rosenshine, but I probably didn't know what it was.

Trainee 2: I had to speak about it in an assessment once. I am not going to lie; it's not something that I went and studied.

(Focus Group 1)

Trainee 9: I'd heard of it but didn't know about it any detail.

Trainee 10: I was unaware of it before the course. Didn't know anything about them.

Trainee 11: I was unaware too, even though I was working for a sport coaching company.

(Focus Group 3)

Having little or no knowledge of the principles provided a fresh theoretical framework for the trainees to work from and explore how to transfer to practice. The Rosenshine Immersion session, followed by the continued use of the resource in university lectures and SE placements, enabled the trainees to experience the principles in action over a sustained period. As Guskey (2002) highlights, any professional development programme should aspire to challenge the attitudes and beliefs of participants with the aim of promoting positive change in their practice. In primary PPE, PD is criticised for often being delivered as one-stop workshops (Jess, McEvilly, and Carse 2017) and has little impact on changing practices in PPE (Harris, Cale, and Musson 2012; Hunzicker 2011). The lecturer referred to this framework in several sessions, re-introducing the principles and modelling them in action, ensuring that trainees were receiving consistent PD that was not just a one-off. Exposure to the principles over a sustained period allowed trainees to recognise the principles and collaborative approach as the core framework for each of the sessions. Consequently, trainees experienced a bespoke PD programme that was tailored to their specific needs. Korthagen (2017) endorses such approaches as the sessions actively engaged participants, integrating theory, practice and reflections of the individuals to deepen their professional learning.

Practical application and impact in PE teaching

All trainees could articulate the positive impact Rosenshine's Principles of Instruction had on their practice. Trainees identified that having principles in their teaching helped with development and structuring their teaching. Rather than going through principle by principle, this next section will explore how they used the principles in practice with some inevitable overlap.

The importance of pedagogical content knowledge (PCK)

Many of the principles Rosenshine suggested overlapped and the trainees' practice cannot be separated into these. The overlap of these principles demonstrated that you 'cannot have one without the other' if you want high-quality teaching and learning to take place.

Although Rosenshine (2012) did not specifically mention that teachers needed good subject knowledge to teach, yet for teachers to successfully draw on Rosenshine's principles in their practice it can be assumed they have good domain knowledge of their relevant area. The importance of

teacher subject knowledge and understanding of PPE-specific pedagogy was vital in being able to support children’s learning:

Trainee 5: Using the STEP model to change the task to suit the learners needs. I had children struggling to catch so I gave them a bigger ball to make it more achievable. All had the option of using a bigger ball if they needed to develop their confidence.

Trainee 6: Giving them choice is important as they can move themselves on. They can see they can run that distance so they might then increase their distance they are sprinting or try catching a smaller ball.

(Focus Group 2)

Trainee 12: I have seen the benefits of using small-sided games. Initially I was doing 4 v 4 games in rounders, but when I broke it down you needed one person to bat and one to bowl to practice those skills. For throwing and catching, one person throws the ball as far as they can and the other person runs and retrieves it. This worked well as you’re stripping the games back to the necessary skills and the small groups kept the engagement higher. Lot of opportunities to practice and support learning.

(Focus Group 3)

Without the subject knowledge and understanding of PPE pedagogy, the trainees would not have been able to make these changes in the act of teaching or designing effective lessons. This alludes to the importance of PCK to enable teachers to scaffold practice, which then facilitates several of Rosenshine’s principles (Rosenhine 2012; Shulman 1986).

Scaffolding is a metaphor for how a learner can be assisted by another (Wood, Bruner, and Ross 1976). Jones and Thomas (2015) describe scaffolding on three levels: macro, meso and micro. Macro is related to the cultural and historical backgrounds of the participants. Meso considers the activities that are organised by teachers to support individual learning. According to Engin (2014), pedagogical scaffolding at the micro-level may be evidenced through interactional talk. Examples include questioning (Engin 2013), elicitation and recapping (Hammond and Gibbons 2005), as well as confirmations, elaborations and reformulations (Mercer 1995). The above examples given emphasise the importance of meso scaffolding, and the design of the learning environment helps shape learning. Here, context is important in that children have lots of opportunities to practice relevant skills in relevant scenarios, such as small-sided games as opposed to isolated techniques, which aligns with GBA to teaching (Bunker and Thorpe 1982; Den and Duyn 1997; Oslin, Griffin, and Mitchell 2006). Drawing on NLP can support designing representative learning environments (Chow et al. 2020). NLP is learner centred that emphasises exploration, individual movement solutions and decision-making skills through interacting with the environment (Correia et al. 2019). The critical thinking behind creating a representative learning environment is to replicate and include relevant information and invitations for actions in specific play and learning scenarios in PE. Teachers need to explore different learning tasks that manipulate constraints such as playing area, number of learners and the session objectives (Chow et al. 2020). Here, along with adopting STEP principles (Space, Task, Equipment and Players), drawing on NLP and GBA to teaching can support in developing PCK.

Questioning and checking for understanding

Enacting micro scaffolding practices emphasised the importance of questioning to check for pupil understanding:

Trainee 3: The use of questioning was massive for us.

Trainee 1: It’s making sure the questions are purposeful. You don’t want to just ask them for no reason. You need a good mix of open-ended questions and sometimes you do need those close-ended questions as well. You probably want to go more open-ended so they can answer freely and not be limited.

(Focus Group 1)

Although the trainees spoke about the use of questioning, they did not provide specific examples of questions they asked or how they would structure them. The failure to identify exemplar questions could be interpreted as the trainees having a limited understanding or lacking practice in this area.

Research has emphasised the difficulty and challenging nature of questioning (Kinnerk et al. 2018). Pritchard and Morgan (2022) aimed to put some concrete footings into a rather abstract concept: 'When is a time question. Where is a question about space. What and how questions allude to identifying a problem with an initial solution, further discussion, and elaboration' (950). Questioning leads to interaction, therefore supporting teachers and particularly these trainees with how to incorporate good quality questioning is a must to move their practice on, as well as the children's understanding (Pritchard and Dockerty 2024).

Monitor and guide independent practice

The importance of monitoring and guiding independent practice was raised in the focus groups; the overlapping nature of the principles emerged along with the importance of PCK to successfully facilitate this:

Trainee 7: The monitoring the independence when children are having a go. The way our lecturer had set the games up in his teaching of games helped. He would take a step back and he could just jump into a game while other games are going on. I think that was a big one that I took forward into my teaching was having the games set up and as opposed to stopping everybody, I could speak to one or a group of individuals while they're still playing and then move around. I thought that was powerful.
(Focus Group 2)

The example here is talking about how to draw on GBA and NLP during teaching to be able to monitor and guide independent practice. There are a variety of GBAs; however, they are unified in the premise that the best way to learn is through playing games that retain the essence of the original but have been modified to reduce the complexity of the full version, such as playing 3 v 3 as opposed to 7 v 7 (Pritchard and Dockerty 2024). Having several games taking place as opposed to one big one enables pupils to have high activity times, which enables them to practice and develop the skill and/or tactical solution to the problem that has been set. Drawing on NLP principles, the learner is an active participant in the learning process and is empowered to search, explore and exploit individualised solutions (Chow 2013; Chow et al. 2021). Through observation, teachers can monitor where children's attainment is before deciding how they will guide them to improve. Drawing on the STEP model can support teachers in adapting their practice to support the learners' needs and, along with developing good domain knowledge, will be able to facilitate the application of Rosenshine's principles of instruction, consequently teaching better lessons.

Providing models

Providing models and worked examples was identified as frequently used across all subjects, not just in PE:

Trainee 5: I use modelling in every single lesson I do; I was in year 1 ... if you want them to do something you've got to show them exactly what you're expecting from them otherwise it's not going to work. You need clear expectations, and I model extensively.
(Focus Group 2)

Using children to model was seen as particularly effective for engagement, relatable performance and classroom management:

Trainee 10: For me providing models was easiest to apply. My early bits of feedback from a PE observation were get the students to do the modelling ... if you highlight something a student's done well and say can you show it to the class, they're eager to demonstrate what they can do in front of their peers ... I found that's better than me modelling because they'll pay attention more to their own classmates and they often perform it to a high level.
(Focus Group 3)

The feedback from Trainee 5 alludes to the importance of context, that is, the age and stage of the children, but also the expectations of the activity. Welch, Alfrey, and Harris (2021) argue that teachers need to be conscious that they are not becoming overly absorbed by their desire to meet learning or

performance outcomes, as this may inhibit children’s potential for creativity, thus preventing learners from expressing themselves in PPE. Having a clear understanding of the task is imperative; however, using children to model may promote creativity and innovation as opposed to replicating a ‘perfect model’ (Pill and SueSee 2017). Using partial models may support this, alluding to Vygotsky’s notion of the teacher as the ‘more capable other’ and guide students in tasks that they otherwise would not be able to solve independently (Vygotsky 1978).

Weekly and monthly review

Trainees recognised the importance of a weekly review to support students in embedding ideas and concepts within their long-term memory. Weekly review was utilised in many different guises:

- Trainee 10: The recap as well at the start of each lesson is important. Especially if you’re doing a unit of work ... being able to recap that previous skill from the week before, especially if they only do that sport once a week is important and from my experience doing that helps them to put it all together.
- Trainee 9: I think the main thing from feedback I received was taking that step back and instead of maybe asking them what they remember or like what they know, it was letting them have a go first like can you show me what we did from last week with your partner and that way you’re bringing in that peer assessment as well.

(Focus Group 3)

Engaging in retrieval practice, the act of actively recalling information from memory to enhance and consolidate learning, is seen as vital for learning and reinforcing learning (Roediger and Butler 2011). Rosenshine (2012) stated that review materials need overlearning, such as newly learned skills, which should be practised passed the point of initial mastery, leading to automaticity. Although the trainees alluded to utilising different strategies, starting sessions with small-sided games, having the opportunity to practice specific skills or specific tactical elements before introducing new material may enhance their practice further (Pritchard and Dockerty 2024). This relates to NLP and GBA in teaching games. This is prevalent in the primary and elementary school setting, where transferability of skills is vital to move across different game concepts (Thorpe and Bunker 1997).

Most of the trainees failed to mention the monthly review, whereas when they did, they found it challenging to implement:

- Trainee 6: I’ve got to stich things together more. Lesson by lesson is good, but I need to look at the whole picture. What skills have we learned as a whole? What have you developed and what can you take on and things like that? If you’ve got lower years like three and four, what can you develop next time?

(Focus Group 2)

The challenges allude to the importance of curriculum planning and developing an understanding of Bruner’s spiral curriculum concept (Bruner 1960). Lack of knowledge around curriculum planning could be partly due to the ambiguity of who teaches the subject, partnered with the challenge of trying to teach the subject in school placements (Griggs and Randall 2019). These issues in ITE have been ongoing for several years (Hardman 2008; Harris, Cale, and Musson 2012), meaning that there has been a lack of opportunity to practice teaching, develop confidence and curriculum knowledge as PE has competed for curriculum time (Duncombe et al. 2018). Therefore, within ITE and particularly in this context, more time needs to be spent developing knowledge of whole school curriculum planning and how each lesson, topic and year link together. As a result, children will be able to transfer and retrieve skills across a multitude of contexts, ultimately developing more knowledgeable, skilled and athletic children.

While this section is framed around the principle of weekly and monthly review, this aligns closely with the broader concept of retrieval practice as both emphasise the deliberate revisiting of prior learning. Indeed, while Rosenshine’s principles (2012) provide a valuable framework for structuring learning, their application to practice within PPE is not without challenge. For example, in contrast to core subjects, PPE is often taught less frequently, resulting in limited opportunities for pupils to

revisit and build upon prior learning. Competition with core subjects is already well established in the literature, with research highlighting that core subjects are taught frequently and consistently as they are prioritised in primary education (Dockerty and Pritchard 2025; Rainer and Davies 2013). Additionally, due to the perceived low academic status of PE (Stolz 2014) compared to other subjects, curriculum time in PE is often reduced or removed and allocated to activities that are deemed to hold greater academic value (Dudley and Burden 2020).

Consequently, future Rosenshine-inspired ongoing professional development in PE should explore the nuances of retrieval practice in PE, with greater emphasis on long-term curriculum planning, deliberately providing opportunities for children to revisit and build upon skills and knowledge across multiple units year-on-year. This exacerbates the need for ITE provision in PE to prepare trainees and develop their knowledge of longer-term curriculum planning that extends beyond individual units.

Opportunities to practice

The students highlighted that a major challenge was ensuring they had enough opportunities to teach PE on placement. Rosenshine (2012) found that the students with more effective teachers had a higher success rate and argued that the best way to become an expert is through practice. This is also relevant for teachers who are trying to improve; they need sufficient time to practice and be provided with many opportunities to teach:

- Trainee 6: I think your practice develops in time because you learn about it and you practice it in lectures. You can then go off and practice in your own teaching on placement.
- Trainee 5: You can talk as much as you want, have conversations as much you want, but if you don't put it in practice, you're never going to know if what your doing is efficient or what you have learned about is going to work. That is a challenge for trainees, getting the opportunity to teach PE on placement. I know students on the general PGCE that haven't taught PE. How are they meant to develop their practice?

(Focus Group 2)

The challenges of teaching the subject and practicing teaching of PPE, regardless of whether it was informed by Rosenshine, were recognised by the students. Being on a specialist pathway enabled them to teach at least three PPE lessons a week, whilst also having significantly more input at university around PPE. However, the concern raised was that of students on generalist pathways, which make up the majority of primary students. Randall (2023), in her study of pre-service primary school teachers' experiences of teaching PE on school placement, reported that out of a sample size of 625, 496 were on generalist pathways. Of the generalist students, 36% of them did not have the opportunity to teach PE, and 31.7% only taught 1 or 2 lessons. The no or limited opportunities to teach alongside the limited university input will mean that opportunities to develop are sparse.

Conclusion

The results generated from the trainees provide some interesting insights whilst also presenting many areas for potential future study.

Despite the trainees all studying PE-related degrees, they had little or no familiarity with Rosenshine's Principles of Instruction. With Rosenshine being aligned with classroom subjects, this was not surprising. All trainees emphasised the positive impact Rosenshine's principles had on their teaching practice, particularly how it helped structure their lessons. Additionally, the initial exposure and modelling by their lecturer helped embed the principles effectively. The importance of PCK to effectively apply Rosenshine's principles came to the fore with the students emphasising the importance of strong subject knowledge and PE-specific pedagogy for effective teaching. Subject knowledge in isolation was deemed insufficient. A concern here was opportunities to teach; the PE trainees had this; however, the concern was that their generalist colleagues lacked teaching opportunities, which has limited their development. This is recognised in the literature and is an ongoing challenge

in the sector. Ensuring trainees can teach PPE on placement needs to be a non-negotiable part of the school experience.

Scaffolding was evident at multiple levels, with GBA and NLP used to support independent practice and engagement, whilst many scaffolded practices were used by using the STEP model to meet learners' needs. Trainees valued the importance of questioning to check for understanding; however struggled to articulate specific strategies. This highlighted the need for more support in developing effective questioning techniques, which is consistent with previous research (Kinnerk et al. 2018). Further research and support for trainee teachers is imperative to develop this in practice (Pritchard and Morgan 2022). The importance of a weekly review in PE to retrieve previous learning was demonstrated and seen as important; monthly reviews were more challenging and forgotten. This highlights the need to develop curriculum knowledge to better develop long-term curriculum planning to ensure a connected physical education journey through primary school.

The importance of providing trainee teachers the opportunity to teach PE during their training must be prioritised to ensure trainee teachers can begin to develop the skills and knowledge needed to teach high-quality PPE. We acknowledge the limitations of the study in the respect that it is a small data set, the second author having familiarity with the trainees. Even with that in mind, the lack of opportunity to teach PPE remains a significant barrier to PD in PPE and needs to be addressed to develop the quality of the children's experience in PE in primary schools.

Disclosure statement

No potential conflict of interest was reported by the author(s).

ORCID

Fran Dockerty  <http://orcid.org/0009-0009-8861-187X>

References

- Braun, V., and V. Clarke. 2022. *Thematic Analysis: A Practical Guide*. Los Angeles: SAGE Publications.
- Bruner, J. S. 1960. *The Process of Education*. Cambridge, MA: Harvard University Press.
- Bunker, D., and R. Thorpe. 1982. "A Model for the Teaching of Games in Secondary Schools." *Bulletin of Physical Education* 18: 5–8.
- Chow, J. Y. 2013. "Nonlinear Learning Underpinning Pedagogy: Evidence, Challenges and Implications." *Quest (Grand Rapids, Mich)* 65 (4): 469–484. <https://doi.org/10.1080/00336297.2013.807746>.
- Chow, J. Y., K. Davids, R. Shuttleworth, and D. Araújo. 2020. "Ecological Dynamics and Transfer from Practice to Performance in Sport." In *Skill Acquisition in Sport*, edited by N. Hodges and M. Williams, 330–344. London: Routledge.
- Chow, J. Y., J. Komar, K. Davids, and C. W. K. Tan. 2021. "Nonlinear Pedagogy and Its Implications for Practice in the Singapore PE Context." *Physical Education and Sport Pedagogy* 26 (3): 230–241. <https://doi.org/10.1080/17408989.2021.1886270>.
- Clohesy, L., R. Bowles, and D. Ní Chróinín. 2020. "Playing to Our Strengths: Generalist Teachers' Experiences of Class Swapping for Primary Physical Education." *European Physical Education Review* 26 (2): 571–586. <https://doi.org/10.1177/1356336X19877195>.
- Correia, V., J. Carvalho, D. Araújo, E. Pereira, and K. Davids. 2019. "Principles of Nonlinear Pedagogy in Sport Practice." *Physical Education and Sport Pedagogy* 24 (2): 117–132. <https://doi.org/10.1080/17408989.2018.1552673>.
- Den Duyn, N. (1997) *Game Sense: Developing Thinking Players*. Canberra: Australian Sports Commission.
- Department for Education. 2021. *The Teacher Standards*. London: Crown.
- Dockerty, F., and R. Pritchard. 2025. "Reconsidering Models-Based Practice in Primary Physical Education." *Education 3–13*: 53 (8): 1273–1284. <https://doi.org/10.1080/03004279.2023.2263470>.
- Dudley, D., and R. Burden. 2020. "What Effect on Learning Does Increasing the Proportion of Curriculum Time Allocated to Physical Education Have? A Systematic Review and Meta-Analysis." *European Physical Education Review* 26 (1): 85–100. <https://doi.org/10.1177/1356336X19830113>.
- Duncombe, R., L. Cale, and J. Harris. 2018. "Strengthening "the Foundations" of the Primary School Curriculum." *Education 3–13*: 46 (1): 76–88.

- Dyson, B., B. Gordon, J. Cowan, and A. McKenzie. 2016. "External Providers and Their Impact on Primary Physical Education in Aotearoa/New Zealand." *Asia-Pacific Journal of Health, Sport and Physical Education* 7 (1): 3–19. <https://doi.org/10.1080/18377122.2016.1145426>.
- Engin, M. 2013. "Questioning to Scaffold: An Exploration of Questions in Pre-Service Teacher Training Feedback Sessions." *European Journal of Teacher Education* 36 (1): 39–54. <https://doi.org/10.1080/02619768.2012.678485>.
- Engin, M. 2014. "Macro-scaffolding: Contextual Support for Teacher Learning." *Australian Journal of Teacher Education* 39 (5): 26–40. <https://doi.org/10.14221/ajte.2014v39n5.6>.
- Griggs, G., and V. Randall. 2019. "Primary Physical Education Subject Leadership: Along the Road from In-house Solutions to Outsourcing." *Education* 3–13 47 (6): 664–677. <https://doi.org/10.1080/03004279.2018.1520277>.
- Guskey, T. R. 2002. "Professional Development and Teacher Change." *Teachers and Teaching* 8 (3): 381–391. <https://doi.org/10.1080/135406002100000512>.
- Hammond, J., and P. Gibbons. 2005. "Putting Scaffolding to Work: The Contribution of Scaffolding in Articulating ESL Education." *Prospect* 20 (1): 6–30.
- Hardman, K. 2008. "Physical Education in Schools: A Global Perspective." *Kinesiology* 40 (1): 5–28.
- Harris, J., L. Cale, and H. Musson. 2012. "The Predicament of Primary Physical Education: A Consequence of "Insufficient" ITT and "Ineffective" CPD?" *Physical Education and Sport Pedagogy* 17 (4): 367–381. <https://doi.org/10.1080/17408989.2011.582489>.
- Hunzicker, J. 2011. "Effective Professional Development for Teachers: A Checklist." *Professional Development in Education* 37 (2): 177–179. <https://doi.org/10.1080/19415257.2010.523955>.
- Jess, M., N. McEvilly, and N. Carse. 2017. "Moving Primary Physical Education Forward: Start at the Beginning." *Education* 3–13 45 (5): 645–657. <https://doi.org/10.1080/03004279.2016.1155072>.
- Jones, R. L., and G. L. Thomas. 2015. "Coaching as "Scaffolded" Practice: Further Insights into Sport Pedagogy." *Sports Coaching Review* 4 (2): 65–79. <https://doi.org/10.1080/21640629.2016.1157321>.
- Kinnerk, P., S. Harvey, C. MacDonncha, and M. Lyons. 2018. "A Review of the Game-Based Approaches to Coaching Literature in Competitive Team Sport Settings." *Quest (Grand Rapids, Mich)* 70 (4): 401–418. <https://doi.org/10.1080/00336297.2018.1484180>.
- Korthagen, F. 2017. "Inconvenient Truths about Teacher Learning: Towards Professional Development 3.0." *Teachers and Teaching* 23 (4): 387–405.
- Krueger, R.A., and Casey, M.A. (2015) *Focus Groups: A Practical Guide for Applied Research*. 5th ed. Thousand Oaks, CA: SAGE Publications.
- López-Pastor, V. M., D. Kirk, E. Lorente-Catalán, A. MacPhail, and D. Macdonald. 2013. "Alternative Assessment in Physical Education: A Review of International Literature." *Sport, Education and Society* 18 (1): 57–76. <https://doi.org/10.1080/13573322.2012.713860>.
- Lynch, T., and G. J. Soukup, Sr. 2017. "Primary Physical Education (PE): School Leader Perceptions about Classroom Teacher Quality Implementation." *Cogent Education* 4 (1): 1348925. <https://doi.org/10.1080/2331186X.2017.1348925>.
- Mangione, J., M. Parker, M. O'Sullivan, and M. Quayle. 2020. "Mapping the Landscape of Physical Education External Provision in Irish Primary Schools." *Irish Educational Studies* 39 (4): 475–494. <https://doi.org/10.1080/03323315.2020.1730218>.
- Marshall, B., M. Quennerstedt, and J. Almqvist. 2024. "Trainee Teachers' Experiences of Learning to Teach Primary Physical Education: A Sociocultural Perspective." *European Physical Education Review* 30 (1): 56–72. <https://doi.org/10.1177/1356336X231197654>.
- Mercer, N. 1995. *The Guided Construction of Knowledge: Talk amongst Teachers and Learners*. Clevedon: Multilingual Matters.
- Ministry of Education New Zealand. 2024. "Pedagogical Content Knowledge." <https://seniorsecondary.tki.org.nz/Health-and-physical-education/Pedagogy/Pedagogical-content-knowledge>.
- Morgan, K., A. S. Bryant, L. C. Edwards, and E. Mitchell-Williams. 2019. "Transferring Primary Generalists' Positive Classroom Pedagogy to the Physical Education Setting: A Collaborative PE-CPD Process." *Physical Education and Sport Pedagogy* 24 (1): 43–58. <https://doi.org/10.1080/17408989.2018.1533543>.
- Ní Chróinín, D., and N. O'Brien. 2019. "Primary School Teachers' Experiences of External Providers in Ireland: Learning Lessons from Physical Education." *Irish Educational Studies* 38 (3): 327–341. <https://doi.org/10.1080/03323315.2019.1606725>.
- Oslin, J. L., L. L. Griffin, and S. A. Mitchell. 2006. *Teaching Sport Concepts and Skills: A Tactical Games Approach for Ages 7 to 18*. 2nd ed. Champaign, IL: Human Kinetics.
- Pill, S., and B. SueSee. 2017. "Including Critical Thinking and Problem Solving in Physical Education." *Journal of Physical Education, Recreation & Dance* 88 (9): 43–49. <https://doi.org/10.1080/07303084.2017.1367741>.
- Pritchard, R., and F. Dockerty. 2024. "Game on! Enhancing Primary Physical Education through a Rosenshine-Inspired Approach." *Curriculum Studies in Health and Physical Education* 16 (1): 82–96. <https://doi.org/10.1080/25742981.2024.2314057>.
- Pritchard, R., and K. Morgan. 2022. "Developing Coach Education to Enhance Rugby Coaches' Understanding and Application of Game Centred Approaches – The Importance of Questioning." *International Journal of Sports Science & Coaching* 17 (5): 943–952. <https://doi.org/10.1177/17479541221104157>.

- Rainer, P., and J. Davies. 2013. "Physical Literacy in Wales—The Role of Physical Education." *Journal of the International Council of Sport Science and Physical Education* 65: 289–298.
- Randall, V. 2022. "Student Experiences of Learning How to Teach Primary Physical Education during the Covid-19 Pandemic." *Journal of Education for Teaching*, 49 (3): 534–536 <https://doi.org/10.1080/02607476.2022.2150537>.
- Randall, V. 2023. "'We Want to, But We Can't': Pre-Service Teachers' Experiences of Learning to Teach Primary Physical Education'." *Oxford Review of Education* 49 (2): 209–228. <https://doi.org/10.1080/03054985.2022.2040471>.
- Roediger, H. L., and A. C. Butler. 2011. "The Critical Role of Retrieval Practice in Long-Term Retention." *Trends in Cognitive Sciences* 15 (1): 20–27. <https://doi.org/10.1016/j.tics.2010.09.003>.
- Rosenshine, B. 2012. "Principles of Instruction – Research-Based Strategies That All Teachers Should Know." *American Educator* 36 (1): 12–39.
- Shulman, L. S. 1986. "Those Who Understand: Knowledge Growth in Teaching." *Educational Researcher* 15 (2): 4–14. <https://doi.org/10.3102/0013189X015002004>. <https://www.jstor.org/stable/1175860>.
- Sperka, L., and E. Enright. 2018. "The Outsourcing of Health and Physical Education: A Scoping Review." *European Physical Education Review* 24 (3): 349–371. <https://doi.org/10.1177/1356336X17699430>.
- Spittle, S., M. Spittle, and S. Itoh. 2022. "Outsourcing Physical Education in Schools: What and Why Do Schools Outsource to External Providers?" *Frontiers in Sports and Active Living* 4: 854617. <https://doi.org/10.3389/fspor.2022.85461>.
- Stolz, S. A. 2014. *The philosophy of physical education: A new perspective*. London: Routledge.
- Thorpe, R, and D. Bunker. 1997. "A Model for Teaching Games for Understanding." In *Teaching Games for Understanding: Theory, Research and Practice*, edited by L. Griffin and J. Butler, 51–62. Champaign, IL: Human Kinetics.
- Vygotsky, L. S. 1978. *Mind in Society: The Development of Higher Psychological Processes*, edited by M. Cole, V. John-Steiner, S. Scribner, and E. Souberman. Cambridge, MA: Harvard University Press.
- Ward, P., and I. Kim. 2024. "Unpacking Pedagogical Content Knowledge in Physical Education: What We Know and Do Not Know." *Kinesiology Review* 13 (2): 176–185. <https://doi.org/10.1123/kr.2023-0076>.
- Welch, R., L. Alfrey, and A. Harris. 2021. "Creativity in Australian Health and Physical Education Curriculum and Pedagogy." *Sport, Education and Society* 26 (5): 471–485. <https://doi.org/10.1080/13573322.2020.1763943>.
- Wood, D. J., J. S. Bruner, and G. Ross. 1976. "The Role of Tutoring in Problem Solving." *Journal of Child Psychology and Psychiatry* 17 (2): 89–100. <https://doi.org/10.1111/j.1469-7610.1976.tb00381.x>.