Game on! Enhancing primary physical education through a Rosenshine-inspired approach

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ABSTRACT

Since Bunker and Thorpe (1982. A model for the teaching of games in secondary schools. *Bulletin of Physical Education*, *18*(1), 5–8.) introduced Teaching Games for Understanding (TGfU), there has been a growing recognition of advocating approaches to pedagogy that addresses participant learning with games-based approaches (GBA) advocated. With little guidance of how to apply these approaches in practice, more support is needed for practitioners (Vinson, D., & Parker, A. (2019). Vygotsky and sports coaching: Non-linear practice in youth and adult settings. *Curriculum Studies in Health and Physical Education*, *10*(1), 91–106. https://doi.org/10.1080/25742981.2018.1555003). This is pertinent in primary where teachers are challenged with teaching a variety of subjects and can struggle to adapt their good classroom practice to Physical Education (PE) (Morgan, K., Bryant, A., Edwards, L., & Mitchell-Williams, E. (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). A criticism has been teachers lack of training and low confidence levels in being able to deliver high quality PE (Clohessy, L., Bowles, R., & Chroinin, D. N. (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). It is imperative that primary practitioners are given more support in applying PE specific pedagogies. Rosenshine's (2012. Principles of instruction - research-based strategies that all teachers should know. *American Educator*, *36*(1), 12–39.) principles of instruction has gained traction in recent years to inform elements of Initial Teacher Training. It provides guidance on effective teaching; however, the examples are classroom focused, limiting application in PE. This paper explores Rosenshine's principles, provides suggestions of employing GBA, before presenting a conclusion that summarises the paper and provides suggestions for future exploration. The intention is to support trained and trainee primary teachers in developing their PE pedagogy.

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Within the domain of complex team games where the people, learning and performance are inseparable from the immediate and wider, dynamic, physical and socio-cultural context (Light et al., 2015), there is a recognition of advocating approaches to pedagogy that addresses participant learning, with games-based approaches (GBA) advocated (Bunker & Thorpe, 1982; Den Duyn, 1997; Mitchell et al., 2013; Potrac, Brewer, Jones, Armour and Holt, 2000). There seems to be a willingness to adopt pedagogical approaches that address the complexity of team games, with a growing body of literature exploring it.

Traditionally, generalist class teachers have primarily been the main delivers of Primary curriculum PE, whilst also teaching the rest of the wide-ranging Primary curriculum (Tsangaridou, 2016). A consistent criticism of the last two decades of the primary setting has been primary generalist teachers' lack of training and low levels of confidence in being able to deliver high-quality PE (Blair & Capel, 2008; Clohessy et al., 2020; Griggs, 2007; Jess et al., 2017; Keay & Spence, 2012). In addition, a growing trend has been to replace teachers with outsourced physical activity and sports providers which has reduced the opportunity for primary teachers to teach PE and thus potentially deskilling the teaching workforce in the delivery of Primary PE (Griggs & Randall, 2018; Keay & Spence, 2012; Rainer et al., 2012; Randall & Griggs, 2020; Smith, 2015). There are potentially numerous benefits of utilising external providers to teach PE such as subject expertise, greater skills and knowledge and opportunities to provide professional development for school staff (Spittle et al., 2022). The intention of this paper is not to debate the provision of PE in primary schools, rather to support all practitioners in their teaching of GBA.

In a PE professional development program that looked at improving primary generalists' PE pedagogy, it was recognised that there was a stark difference in teaching quality between the classroom and the PE environment (Morgan et al., 2019). Morgan et al. (2019) noted that in the classroom children were on task, willing to learn, listen to each other with clear learning objectives and structure to the lesson evident. However, in PE the pupils often lacked motivation and engagement, with a lack of inclusion and differentiation evident. Furthermore, learning objectives and success criteria were absent (Morgan et al., 2019). Clearly, there is a need to support primary generalists' subject and pedagogical knowledge in PE and transfer their good classroom practice into the PE environment. If this can be addressed, then PE can be kept 'in house' as opposed to relying on using external providers. Therefore, greater attention and exploration need to be paid to underpinning theory and its application that addresses improvement in teachers' PE pedagogy.

In an educational context, Rosenshine's (2012) 'Principles of Instruction: Research-Based Strategies That All Teachers Should Know' has gained traction in recent years having been recognised as a key text to inform elements of teaching practice (Twiselton et al., 2019). Broadly speaking, Rosenshine presents 10 research-informed principles of instruction along with suggested ways to apply them in the classroom. The article provides clear guidance on many aspects of effective teaching and learning; however; the examples provided are focused on the classroom with no mention of PE. Considering the lack of training in ITT around PE (APGG, 2016) and generalists struggling to apply their classroom practice in PE (Morgan et al., 2019), we aim to provide more guidance to practitioners in applying GBA by utilising Rosenshine's principles of instruction as a supportive mechanism to inform practice. It is worth noting we are not presenting

empirical data from a specific project, rather drawing on our own research and our cumulative twenty-plus years of experience in sports coaching, primary, secondary and higher education (Dockerty & Pritchard, 2023; Pritchard, 2019; Pritchard & Morgan, 2022).

Therefore, following this introduction, we will give a background to GBA before introducing Rosenshine's work and introduce the 10 principles of instruction. Following this, we will delve into suggestions of how to apply the principles in games, supported by theoretical underpinnings, before presenting a reflective conclusion that summarises the paper and provides suggestions for future exploration and study.

Teaching of games – a context

The original games-based approach was Teaching Games for Understanding (TGfU) which was developed by academics at Loughborough University due to concerns with how games were being taught and how it did not develop good game players (Harvey et al., 2018). Traditionally, TGfU has been accredited in its development to David Bunker and Rod Thorpe, with Len Almond being recognised as having a major part to play in its development, particularly the focus on developing understanding in TGfU (Almond, 2015). However, several other academics at Loughborough University became involved in its inception including David Kirk and Lynne Spackman, with Spackman suggesting they develop their ideas into a model, along with Sarah Doolittle, Karen Booth and Terry Williamson also being part of the development of TGfU. The collaboration of the academics developed the notion of TGfU (Harvey et al., 2018). They suggested that an emphasis on teaching techniques separate from the game resulted in poor decision-making, poor tactical awareness and the inability to apply the learnt techniques in a game context. Bunker and Thorpe (1982) proposed that students should learn skills in contexts that are tied to developing tactical knowledge and grow a sense of what the game is about at the same time.

In conjunction with the development of TGfU, Bunker and Thorpe (1982) argued that some groups of games share key characteristics determined by their rules and tactics. They suggested games, such as rugby, football, basketball, netball and hockey, can be categorised as invasion games as they share the common tactical features of invading territory to make space in attack, containment of space defensively and a goal or target to score. The TGfU model, along with the grouping of games, was recommended as a focus for planning individual lessons, units of lessons and an overall games curriculum (Thorpe & Bunker, 1997).

Since TGfU was developed, other GBAs have emerged in scholarly literature, influenced by local culture, institutional contexts or simply as a different way of thinking about pedagogy (Almond, 2015). All the approaches differ slightly; 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. This is particularly prevalent in the primary and elementary school setting.

Game Sense (Den Duyn, 1997) is less structured than TGfU and open to interpretation as there is no prescribed model, just guiding pedagogical principles: (1) designing a game-based learning environment, (2) emphasising questioning and other indirect teaching/coaching strategies to generate dialogue, (3) providing opportunities for collaborative

formulation of ideas/solutions that are tested and evaluated and (4) developing a supportive socio-moral environment (Light, 2013). The Tactical Games Approach (TGA) (Griffin et al., 1997) emerged in the USA, with the model dealing with the relationship between skills and tactics, by locating specific skills within game-like situations (Light, 2013). The TGA adopts the model of 'game-question and answer-practice task-game', with the game becoming more complex as the session progresses. The TGA pays more attention to skill execution, whereas TGfU introduces new techniques and skills when the players reach a level of gameplay that required them to learn a new technique (Kirk & MacPhail, 2002). Pritchard and Morgan (2022) utilised the TGA to support six student coaches in their delivery of rugby to children aged 9 and 10, with the lesson structure noted as a supportive framework in adopting GBA. These are two of the more prominent approaches that emerged from the original TGfU scholarly work. There is a wealth of literature on the various approaches, however, identifying how they differ can prove challenging, causing new proponents of GBA to stick to the approach that they are most familiar with, thus not exploring other possible avenues (Light, 2013).

For the purpose of this, we will not be advocating a specific application of a certain approach, rather draw on some of the core features of GBA in support of applying Rosenshine's principle within a games-based environment.

Barak Rosenshine and his ideas

Rosenshine identified 17 principles of effective instruction (Rosenshine, 2010) before condensing them into the 10 that we are focusing on here (Rosenshine, 2012). The principles 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 were derived from these sources, and it is these ideas which will be described and discussed in this article within the PE context. Below are the principles which will be explored in the next section:

(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.

The principles in action

Within this section, we discuss Rosenshine's principles of instruction and make suggestions for practical application. It is worth noting we have chosen to group some of

Rosenshine's principles together. We have combined guiding student practice, checking for student understanding and providing scaffolds for difficult tasks. Furthermore, we have combined guiding student practice and monitoring independent practice. We felt that combining these principles would eliminate repetition and marry up our interpretation of theory and practice.

1. Begin a lesson with a short review of previous learning: daily review can strengthen previous learning and can lead to fluent recall

Background

Rosenshine (2012) identifies daily review as an important part of instruction as it helps strengthen the connection to previous material learned. He further states that daily review can help recall concepts and procedures effortlessly and automatically, consequently freeing working memory capacity (Rosenshine, 2012). Contextualising this within games could mean developing movement competence and knowledge of rules, strategies and tactics, which are key features of GBA. Therefore, we need to review concepts, skills, tactics and practices on a regular basis to develop competence in fundamental movement skills (FMS) and game development. FMS are the foundational skills that enable the acquisition and development of more complex skills as this forms the foundation for more complex movement skills that are relied on heavily in a variety of physical activities (Seefeldt & Gould, 1980). However, this perspective assumes a 'one size fits all approach' to movement, therefore, a reconceptualisation of FMS to functional movement solutions is imperative (Rudd et al., 2021). Functional movement solutions refer to the repertoire (cognition, perception, and actions) of behaviours that allow an individual to navigate the environment, interact with others and negotiate tasks to achieve intended goals (Chow et al., 2020). In short, being able to move competently is not enough; a knowledge of context and the ability to interact with it is a non-negotiable of practice.

Application to practice

When teaching games, drawing on GBA can support teachers in developing functional movement solutions. The TGA adopts the model of 'game-question and answer-practice task-game', with the game becoming more complex as the session progresses. The TGA pays specific attention to skill execution, (Kirk & MacPhail, 2002). Below are some suggestions as to how the TGA can be applied in practice:

- Starting the lesson with small-sided games such as 3 v 3 enables pupils to practice and review skills in relevant contexts, supporting the development of functional solutions as opposed to standardising movements. The question-and-answer element enables teachers to correct misconceptions, identify effective solutions to problems and promote challenge.
- The practice task allows the children to focus on a specific skill or tactical element in isolation, such as throwing, catching or dribbling. This can be children simply throwing and catching the ball in a designated area. This supports the children in developing creative throwing and catching solutions, creating variety whilst also having to be aware of the environment as other children will be doing the same. This facilitates the children in finding and exploiting space before they move back into their small-

sided games. Applying this lesson structure supports the frequent review of concepts, skills, tactics and the development of understanding (Almond, 2015).

2. Present new material in small steps with student practice after each step: only present small amounts of new material at any time, and then assist students as they practice this material

Background

Rosenshine (2012) found that the more effective teachers introduced new information in small steps. Our working memory can only process small amounts of information, therefore introducing too much at once can overwhelm, confuse and limit students' ability to process information. Introducing information in small steps and then guiding students' practice can support them in overcoming these challenges (Rosenshine, 2012). This idea of introducing new information relates to Cognitive Load Theory (CLT), which is based on the idea that our working memory can only deal with a limited amount of information at one time (Sweller, 1988). CLT suggests if the cognitive load exceeds our processing capacity, we will struggle to complete the activity successfully (Shilbi & West, 2018). Considering Rosenshine's (2012) and Sweller's (1988) perspective, teachers need to consider their interactions with the pupils they're teaching in terms of keeping language (and activity) in use simple and concise. Vygotsky (1978) argued for the importance of language in supporting cognitive development, emphasising that

> … words can shape an activity into a structure. However, that structure can be changed or reshaped when children learn to use language in ways that allow them to go beyond previous experiences when planning future action … . (p. 28)

Application to practice

With the above perspectives in mind, this section explores how teachers could potentially apply some of the ideas above in a game-based environment.

- When teaching children how to dribble a ball, give all children a ball and ask them to dribble in a marked-out area. This simulates the game by creating moving stimuli (as they would in a game) by having to avoid others, however, does not have others trying to tackle them or have the target of working towards a goal or net. This introduces the skill in a contextual setting, which is simplistic in nature, whilst also keeping teacher input to a minimum (Light, 2013). The teacher can assess the student's attainment and improvement before adding more or removing challenges (making the area smaller/ bigger, putting defenders in, moving towards a goal, etc). A similar approach can be used when introducing other skills such as sending and receiving.
- When introducing games to children, utilise small-sided games as per the TGA (Mitchell et al., 2013). For example, have children experiencing lots of 1 v 1, 2 v 1, 3 v 2 and 3 v 3 scenarios. This enables children to experience the game in a more accessible way, whilst keeping teacher instruction limited. Small-sided games allow for children to have multiple opportunities to practice skills such as throwing, catching, running and tackling in a game context. Within the game, teachers will be able to

observe children's practice and see where they can move the children's knowledge, understanding and application further (asking leading questions, providing the start of a solution, etc).

3. Ask a large number of questions and check the responses of all students: questions help students practice new information and connect new material to their prior learning

Background

Rosenshine's (2012) questioning focus was that of the classroom and for the procedures to address active participation and to allow the teacher to see how many students were correct and confident. The above focus alludes to there always being a 'right' answer; however; that is not the case in PE. The context of PE is different; therefore; being aware of the purpose of PE is central to the authors' consideration and approach to questioning.

Evident in Games Based literature is a focus on the importance of questioning and language; a belief that the teacher should ask open-ended questions to encourage understanding of the tactical dimensions of games and the appropriate performance of skills (Mitchell et al., 2013). Research has emphasised the difficulty and challenging nature of questioning (Kinnerk et al., 2018), with insufficient content knowledge (Roberts, 2011), lack of planning (Karagiannis & Pill, 2017) and the teacher or coach feeling condemned to ask questions whilst not listening to the responses, leading to a lack of clarity for all (Thomas et al., 2013). Therefore, supporting teachers with how to incorporate good quality questioning is a must to move their practice on as well as the children's understanding.

Vygotsky emphasised the importance of language when co-constructing knowledge and understanding, drawing attention to the types of questions being asked (Vygotsky, 1978, 1986). Although not providing specific guidance as to how to scaffold learning, Vygotsky does refer to collaborating, providing direction through assisting, providing initial elements of a solution and asking leading questions (Daniels, 2001). Asking leading questions invites children to share ideas and take learning in a way they choose. 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? What, where, when and how embodies Vygotsky's thinking around learning (Pritchard & Morgan, 2022).

Application to practice

As the literature alludes to knowing when and how to question can be a challenge (Light, 2013); therefore; below is a list of strategies practitioners may use to facilitate high-quality questioning:

- Asking the children to freeze during an activity before asking a leading question to initiate interaction. For example, 'What two things are your team going to do to create space in attack?'
- Ask children to discuss ideas in their groups or teams. For example, 'What can you do in defence to limit the opposition's space?'

- Ask children in their groups or teams to feedback to another group or team on what they are doing well and how they can improve.
- Create a success criterion with the children and from that generate questions for peer-to-peer feedback. For example, 'How has your partner met the success criteria? What can they do to improve? What movement was your favourite and why?'
- At the end of activities or lessons ask children 'What three things have you learned in this lesson? How have those three things made you improve?'

4. Provide models: providing students with models and work examples can help them learn to solve problems faster

Background

Rosenshine (2012) identifies teacher modelling and thinking aloud whilst demonstrating how to solve a problem as an example of effective cognitive support. A further example is that of worked examples for which the teacher provides the solution and also the steps taken to solve the problem. The limitation here for teachers teaching through GBA is that every situation and moment in a game is different. Laying out a step-by-step approach for a solution becomes unrealistic and does not consider the chaotic nature of a game. We are not dismissing modelling as a pedagogical approach, rather greater thought as to its application in practice and its impact on learning.

When using modelling to promote good examples of practice, Welch et al. (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 PE. Although, to some extent, we want children to imitate the good examples that they see, we also want to encourage creativity and innovation through discovery (Memmert, 2015; Pill & SueSee, 2017).

Application to practice

Developing understanding was an important feature of TGFU. Thorpe and Bunker (1997) highlighted that a person who understands football can appreciate what players are trying to achieve in hockey and likewise in basketball as they all come under the invasion game bracket that share similar concepts. Developing understanding and transferring this understanding across different contexts needs to be a consideration of teachers when adopting GBA. Below are some suggestions as to how modelling can be incorporated to facilitate contextual transfer across game scenarios:

- Walk through and explain different solutions to 2 v 1/ 3 v 2/ 3 v 3 attacking or defending scenarios.
- Within scenarios, position defenders and attackers in different positions to change the problem, change the pitch size and change the start position of the ball.
- Provide the first part of the solution before asking children to solve the next step.
- Use cones to simulate the players and talk through potential examples. Encourage the children to add their ideas and contribute.

- Ask children to walk things through and explain their thinking-pose questions to facilitate developing understanding.
- Ask what-if questions/provide scenarios to further develop understanding.

5. Guide student practice: successful teachers spend more time guiding students' practice of new material. 6. Check for student understanding: checking for student understanding at each point can help students learn the material with fewer errors. 8. Provide scaffolds for difficult tasks: the teacher provides students with temporary supports and scaffolds to assist them when they learn difficult tasks

Background

Rosenshine (2012) states that it is not sufficient to just present students with new material, whilst also recognising the importance of checking understanding and providing scaffolds within instruction. Therefore, engaging with the notion of scaffolding or scaffolded practice can be a useful lens to support teachers in applying these principles of instruction and meet the demands of teaching (Wells, 1999). Borrowing heavily from Jones and Thomas (2015), scaffolding is a metaphor as to how a learner can be assisted by another (Wood et al., 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 in order 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 & Gibbons, 2005), as well as confirmations, elaborations and reformulations (Mercer, 1995).

Application to practice

Focusing on the importance of interaction and within that the language in use acknowledges that learning within GBA is situated within a social context (Light, 2013; Light & Fawns, 2003). The below examples aim to illustrate how principles 5, 6 and 8 can be applied whilst drawing on relevant GBA and scaffolding literature:

- Giving children time in activities to explore can create the time and space for teachers to observe. Children need time to immerse themselves in the activity and have numerous opportunities to experiment with possible solutions to the task. For example, not stopping the activity after thirty seconds to provide feedback. Children are still feeling their way into the game and cooperating with their teammates. Giving time enables children to begin to identify tactical solutions or adjust skill application. After observing for at least three minutes, you will begin to identify trends that are emerging, providing you with the space to actively guide student practice.
- Interaction will facilitate guiding student practice, checking for understanding and providing scaffolds. Freezing and rewinding tactical activities such as a 3 v 2 and asking the children to articulate what and how they did something. Give the children cones to simulate players and ask them to explain their understanding. As a teacher, you can ask them to elaborate whilst challenging them further, such as making it a 4 v

3. This allows children to reformulate their understanding, whilst also sharing it with others

- Partially modelling examples can provide the initial element of a task solution. Walking through and discussing possible solutions to a tactical problem can begin to generate possible solutions for the children.
- To check understanding and scaffold practice requires the learning to be situated in relevant contexts. For example, if teaching tennis the first thing the children should do is hit the ball over the net and see if they can create a rally. If teaching attacking and defending scenarios, ensure that there is opposition to play against. Make the pitch bigger if you want to make it easier to find space or make it smaller if you want to make the task harder. This will provide relevant scenarios for the children and contextualise the learning experience.
- Social interaction plays an important role in supporting learning. Prioritise this by picking up frequent one-to-one and small group conversations. The importance of language cannot be underestimated; therefore; considering the language in use, its functions and outcomes and how it can be altered needs to be considered (Jones & Thomas, 2015). Utilising questions (see principle 3) and drawing on scaffolding practices (Engin, 2013; Hammond & Gibbons, 2005; Mercer, 1995) can support practice.

7. Obtain a high success rate: it is important for students to achieve a high success rate during classroom instruction. 9. Require and monitor independent practice: students need extensive, successful, independent practice in order for skills and knowledge to become automatic

Background

In his research, 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. In short, provide time for children to engage in relevant and appropriate activities. Facilitating opportunities to develop a high success rate does not mean that the tasks set should not challenge children's learning, rather it draws focus to practice design that supports the intended learning outcomes. Drawing on GBA can support with pedagogical practices and more specifically the TGA can support with effective practice design as a result of its structured nature (Mitchell et al., 2013). Indeed, in this context we are aiming to facilitate 'repetition without repetition'; that is to 'design-in' the appropriate amount of variability and (in)stability to practise (Renshaw et al., 2019). Varying the context and practice can support with intrinsic motivation (Deci & Ryan, 1985) and if designed appropriately, obtain high success rates through independent practice in challenging situations.

Application to practice

Ensuring independent practice and a high success rate that also has an appropriate level of challenge needs to be the priority in PE. Creating a learning environment that is challenging and promotes high success is not a straightforward process. Developing learning environments that privilege this should be prioritised in teachers' practice. Utilising STTEP principles (Long & Grout, 2009) can support educators in adapting to meet

the learning needs of the child. Adjusting one of these aspects enables the teacher to adapt the activity or instruction to personalise the needs of the learner. STTEP refers to the space used, time allowed, the task, the equipment used and people with that element referring to how you group participants for the activities. Adjusting one of these aspects enables the teacher to adapt the activity or instruction to personalise the needs of the learner. The suggestions below are intended to support teachers' application of this:

- When working on throwing and catching, use a bigger ball if struggling to catch using a smaller ball. In a possession-based activity, making the space bigger or reducing the number of defenders can promote a high success rate. This could be as simple as in a 4 v 3 scenario, making it a 4 v 2 scenario to facilitate success before adding the 3rd defender back in.
- In a striking and fielding practice, it could mean working in groups of 3 with the children rotating around being a batter, backstop/wicketkeeper and bowler. This will provide children with many opportunities to practise these skills in a modified game environment.
- Modify the equipment – for example, in tennis, lower the net for beginners and use orange tennis balls that will bounce higher. This will enable the children to access and practise the relevant skills before moving on to a fuller version of the game.
- Involving children in cthe reation of activities can promote a high success rate for the children, whilst enabling the teacher to create challenges through interaction. For example, asking children to create a game that aligns with the lesson objective. The lesson focus could be to do with throwing at a target and the children create a game around this. This enables them to create ownership of their learning and facilitates the space for you as the teacher to scaffold and challenge.

10. Engage students in weekly and monthly reviews: students need to be involved in extensive practice in order to develop well-connected and automatic knowledge

Background
According to Rosenshine (2012), students need extensive practice to develop well-connected networks of ideas in their long-term memory. When an individual's knowledge on a topic is large and well-connected, it is easier to learn new information and prior knowledge is more readily available for use. The more an individual rehearses and reviews information, the stronger these interconnections become. Developing a curriculum that has contextual transfer across a variety of activities can support by developing well-connected knowledge within Games.

Application to practice
The suggestions below aim to help support the application:

- Consider designing a curriculum that looks at and addresses transferrable skills. For example, designing game units across a year that looks at tactical development

across similar game categories, rather than focusing on one sport. This provides children a wide range of experiences, whilst also being engaged in frequent weekly and monthly reviews.

- Ensuring you are designing and developing activities for children to practice functional movement solutions across all areas of the curriculum. Making connections between functional movements across a variety of contexts can support children in making well-connected and automatic knowledge of how they move.
- As mentioned previously, give children time in activities to explore and innovate. Providing the time will support with internalising new knowledge.

Conclusion

The aim of this paper has been to provide some practical strategies for teachers in adopting GBA, underpinned by Rosenshine's principles of instruction. By taking Rosenshine's (2012) guidance for effective teaching and learning in the classroom and applying these strategies in a PE context, we propose that generalist primary school teachers can continue to develop their practice by transferring quality classroom pedagogy to the PE environment (Morgan et al., 2019), specifically through GBA. Although this paper is principally aimed at trainees and current primary practitioners, the strategies can be used and adapted to all ages and stages of learners within PE and Sports Coaching (Cope & Cushion, 2020). Future studies could explore how ITT providers use Rosenshine to develop trainees' competence and confidence in developing their teaching of PE. Additionally, there is scope for future empirical studies to investigate how Rosenshine's principles can support developing generalist teachers' pedagogical content knowledge to reducd schools' reliance on outsourcing PE. The criticisms of Primary PE are wide-ranging; however, we contend that this paper has made a small positive contribution in supporting teachers' competence and confidence in teaching through GBA which, in turn, will benefit the children on their lifelong physical activity journey.

Disclosure statement

Notes on contributors

Rhys Pritchard is the Head of Primary Physical Education at the University of Worcester. Rhys completed his doctorate in Sports Coaching that looked at utilising Vygotskian notions to inform a coach education program that aimed to improve coaches' practice of utilising game-based pedagogy in a sporting context. His research interests lie in sports pedagogy, learning theory, coach education and improving PE teachers' practice. He is a qualified Primary school teacher and Level 4 Rugby Coach.

Fran Dockerty is a lecturer in Primary Education at the University of Worcester. Fran taught in schools for 8 years working as a Primary PE subject lead and class teacher before entering higher education. Fran is at the thesis stage of his Doctorate in Education that looks at mentoring primary Physical Education subject leaders to develop game-centred approaches across their schools. As part of his doctorate, Fran has also researched child obesity policy, philosophy of Physical Education and models-based approaches to teaching physical education.

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