

## **Developmentally Appropriate Pedagogy Within a Games-Based Approach**

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## **ABSTRACT**

**Purpose:** This article is designed to help physical education teachers and specialists plan developmentally appropriate games that emphasize physical literacy skills and concepts across each grade level. **Conclusion:** Consider the varying developmental levels of the learners across each grade level while planning teaching episodes. While some might consider physical education to be primarily focused on physical and motor skill development, cognitive and psychosocial development also play a critical role in game play. The elements of rules and expectations, game play boundaries, student roles, equipment selection, levels of tactical and strategic game concepts, types of questions appropriate to ask students, etc. This article provides a brief description of the varying developmental levels to consider across varying grade levels, breaks down the appropriate concepts and considerations related to gameplay, and makes recommendations for appropriate game-play planning for each major grade level band.

**Keywords:** Instruction, K-12, physical education, tactical approach, sports

## **1. INTRODUCTION**

Teaching physical literacy skills and concepts through a developmentally appropriate games-based approach can have extreme learning and motivational benefits for learners in physical education, regardless of the grade level (Haibach-Beach, Reid, & Collier, 2018; Pangrazi & Beighle, 2015). Teaching physical education using a developmental perspective helps to ensure that students have the physical, social, cognitive, and psychosocial skills required to effectively engage in lesson material (Haibach-Beach, Reid, & Collier, 2018). This article serves to provide a guide for educators as they develop games-based units of instruction for their respective age-level learners, K-12. This article lays the foundation for developmentally appropriate games-teaching practices across all school-aged students. Planning developmentally appropriate units of instruction and lessons will require the educator to be familiar with the needs of the age-level learners that they are preparing to teach. Thus, understanding the physical, motor skill, cognitive, and psychosocial development and abilities of the learner is imperative for proper planning and encouraging successful student outcomes (Haibach-Beach, Reid, & Collier, 2018). Human development occurs at varying paces and begins and ends at different times in different individuals' lives. Overall, development is age-related, not age-dependent, meaning that an individual does not necessarily change levels of development just because they reach a certain age (Haibach-Beach, Reid, & Collier, 2018).

First, this article introduces the four different types of human development: physical, motor skill, cognitive and psychosocial. Subsequent sections specifically describe the intricacies of lower and upper elementary, middle, and high school age-level learner stages of development related to games teaching. Each grade level section ends with recommendations for effective planning and instruction, which are categorized by the main tenets of games-based approaches to teaching games.

## **2. DEVELOPMENTAL CHARACTERISTICS ACROSS AGE-LEVEL LEARNERS**

Physical development refers to the growth and maturation of cells over the course of someone's life, typically in relation to changes in the skeletal, muscular, and nervous systems (Haibach-Beach, Reid, & Collier, 2018). As one's physical body changes, there are direct impacts on motor skill performance; learning, cognition and thought processes; and psychosocial identity and self-representation behaviors and preferences. These systems are interconnected within the body. Motor skill development is described as the process related to one's ability to perform motor skills (e.g., jumping, running,

throwing, catching) with coordinated movement patterns and control (Haibach-Beach, Reid, & Collier, 2018). Motor skill development phases are defined by levels of proficiency, coordination, and control, which are directly influenced by one's physical development. According to Cleland Donnelly, Mueller, and Gallahue (2016), the fundamental motor skill phase can be broken into three distinct stages:

- Initial: One's initial attempts at performing a motor skill.

- Elementary: Motor skill performances that display some of the expected critical elements of the skill but not yet displaying perfect technique.

- Mature: When an individual is relatively consistently performing a motor skill with all of the critical elements and appropriate technique.

These stages are desirable to have mastered before the end of elementary school grade levels to ensure students are ready for more complex motor skills in middle and high school (Stodden et al., 2008). After mastering the fundamental motor skills (locomotor, manipulative, and stability skills) in the fundamental motor skill phase, students may enter the sport-specific phase of motor development. This phase includes transition and application stages where participants are using fundamental motor skills in sports specific games (e.g., no longer catching with two hands but rather, catching one-handed or with a glove). Motor skill development will gradually change over the course of a K-12 program due to personal experiences and deliberate, sequential, and developmentally appropriate instruction (Haibach-Beach, Reid, & Collier, 2018). Cognitive development describes the influences over analyzing, learning, absorption of facts, abstraction, planning, and decision making over time and can be broken into four distinct stages, as originally noted by Jean Piaget (Haibach-Beach, Reid, & Collier, 2018):

- Sensorimotor state: Typically ages 0-2 when children generally experience the world and movement through their senses.

- Preoperational stage: Typically 2-7 years of age, where children have illogical thinking and tend to be very egocentric.

- Concrete operational: Typically ages 7-11 years, when children begin to think more logically but cannot think abstractly about things they have not yet experienced

- Formal operational stage: Typically 11 years old and older, where logical thinking and abstract problem-solving are evident; Haibach-Beach, Reid, & Collier, 2018.

In relation to teaching games, it would be imperative that an individual have the basic ability to comprehend and follow rules, maintain cognitive flexibility by allowing rules to change, and comprehend and work toward the goal of a task (whether it be cooperative or competitive). Psychosocial development is often used as an umbrella term to describe how the affective domain, value systems, social identity, and self-among-others develop over time (Haibach-Beach, Reid, & Collier, 2018). Psychosocial characteristics will dictate the extent to which game play can realistically occur, based on a

player's abilities to work together toward a common goal, accept others' thoughts and perspectives, perceive oneself as worthy, utilize appropriate social skills, and develop personality. Haibach-Beach, Reid, & Collier (2018) present the typical stages for psychosocial development that were originally categorized by Harter in 1999:

- Very young children: Over predictors of their actual abilities.
- Early childhood: Overestimate and remain positive about abilities.
- Later childhood: Begin to realize that others are judging their abilities and realize they have more specific abilities in different areas of life
- Early adolescence: Very sensitive to the opinions of others.
- Middle adolescents: Greatly influenced by opinions and standards of others while realizing they act differently with different groups of people
- Later adolescence: A clear individualized sense of one's values and beliefs with a clear trajectory for accomplishing life goals, also characterized by independence

### **3. ALIGNING THE MAIN TENETS OF THE GAMES-BASED APPROACH TO HUMAN DEVELOPMENT**

The tenets of the games-based approach may include the use of small-sided, modified games with emphasis on learning skills and concepts through game play, game appreciation, tactical awareness, appropriate decision making, situated skill execution and practice, skill performance, and transfer of learning to other games. Because developmental stages vary, educators will need to critically consider factors like equipment sizes and game setup to account for physical development, exaggeration and emphasis on skill acquisition related to motor skill development, tactical complexity due to cognitive development, and team dynamics and practice structures due to psychosocial development.

Game appreciation involves the structure and history of the game. Structure includes rules, boundaries, objective of game, equipment utilization, movement possibilities, and the like. Tactical awareness is when children become aware of the purpose of the game and the situations in which decision making is used to enhance game play. Typically, evident gaps in students' knowledge and skill in tactile games can be observed during initial modified game play (Metzler, 2011). Decision making involves the thought process of figuring out which skills are needed to apply tactical knowledge and how to utilize those skills. Situated skill execution includes the specific skill development as students' understanding of tactical awareness and appropriate decision making improve. Performance and transfer is the time in which students are performing their newly learned tactics and skills (during situated skill execution) in a modified game-like setting. Additionally, this is

the time where transfer of skills from one setting to another occur, whether it is transferring skills from skill execution stage to game play or transfer of skills between different games in the same game category.

## **4. DEVELOPMENTAL CONSIDERATIONS OF GAMES-BASED APPROACH ACROSS THE SCHOOL-LEVEL LEARNERS**

### **4.1. Game Play at Lower-Elementary Levels (Grades K-2; ages 5-6)**

Children in lower-elementary school grade levels do not yet have the skill or cognitive development to participate in more complex or regulation-type sports (for example, 11 versus 11 soccer). These young children do not possess the ability to work with others in a meaningful and consistent way. Children at this level cannot think of others aside from themselves (egocentrism) and therefore do not understand the concept of sharing and working toward a common goal with teammates (Haibach-Beach, Reid, & Collier, 2018). Nor do they have the gross motor skill development and control to rely on team members for accuracy in team-based skills (e.g., passing and catching a ball, or accurately placing a ball where your teammate needs to be for an advantage). To practice “game play” at this level, students need to work mostly individually on control of manipulative skills as opposed to using competition. The simple practice of throwing and catching a ball can be considered “playing a game” to a young child. Since children at this developmental stage are not experienced in working with others to achieve a common goal, the inclusion of cooperative activities and games that teach children how to communicate and work effectively together is extremely important (Pangrazi & Beighle, 2015). Refer to Table 1 for game considerations and modifications appropriate for lower-elementary children.

Table 1.

**Game Considerations for Lower-Elementary Children**

<b>Game</b>	<b>Expectations/Class Structure</b>
<b>Appreciation</b>	-frequently remind students of “play, practice, play” class structure
	<b>Rules and Game Structure</b>
	-limit competitive play; focus on competition with self or within small groups -use storytelling and metaphors for rules and history -simple rules and consequences for breaking rules -use guided discovery so students personally understand meaning behind and purpose of rules, boundaries, and scoring -large space and textured flooring (and equipment) will help slow game play down to focus on skill development
<b>Tactical Awareness</b>	<b>Equipment and Space</b>
	-scaled to size of learner -change equipment often to allow variability of skill and transfer -consider size, weight, texture, and color contrast to meet needs of children’s visual and physical development -textured balls and field allow for the game to slow down
	-introduce maintaining possession, penetrating, attacking, and start and restart tactics in simplified versions -maintaining possession comprised of developing control and coordination of skill -tag and dodge, chase, and flee games are typical -debrief or critical thinking session immediately post-game
<b>Decision Making</b>	-focus on basic understanding of how to move through space (spacial awareness and proprioception) before the manipulation of equipment -teach basic awareness of tactical concepts within games to understand why skills and tactics are needed
<b>Situated Skill Execution</b>	-vary developmentally appropriate movement experiences by exploring movement concepts, bodily movements, spatial awareness, and proprioception -allow for individual guided discovery to discover appropriate equipment and movement pattern for skill development -practice skills individually in self-paced and closed-environment settings -allow children to compare against self to teach effort and gauge self-improvement
<b>Performance and Transfer</b>	-explicitly describe use of similar skills and tactics (e.g., use of space) between games in same game category and across different game categories -frequent change in rules and equipment facilitate ability to transfer tactics and skills

**4.2. Game Play at Upper-Elementary Levels (Grades 3-5; ages 7-10)**

During this age range, children are developmentally ready to continue cooperative games and progress toward more competitive game-like situations. Physically, children are growing steadily. Students are developing visual acuity (sharpness) but still have trouble with figure-ground perception, and thus, have difficulty tracking objects (Haibach-Beach, Reid, & Collier, 2018). Children’s understanding of space and safety, ability to combine a variety of (mostly coordinated) motor skills, and their newfound ability to work

cooperatively with others and recognize others' perspectives allow for the introduction of modified and small-sided games that have a team-based approach. Additionally, children at this stage begin to understand more complex and intangible concepts, including the basics of game strategy, planning to evade or trick an opponent, and understanding that rules and other constraints can be manipulated to influence game play. For example, changing the rules to elicit more passing (Haibach-Beach, Reid, & Collier, 2018). Refer to Table 2 for game considerations and modifications that are developmentally appropriate for upper-elementary school students.

**Table 2.****Game Considerations for Upper-Elementary Children**

<b>Game</b>	<b>Expectations / Class Structure</b>
<b>Appreciation</b>	-reteach "play, practice, play" class structure -begin lightly competitive games (if children are psychosocially ready) -modified and small-sided game play will emerge
	<b>Rules</b>
	-use basic tag and chase games -slowly combine variety of skills for tactical purpose in open environments -introduce lead-up games with emphasis on manipulative skill development -continue to slowly release more complex rules -ensure that rules allow for many practice opportunities -teams of no more than four players (to avoid too many options for decisions)
<b>Tactical Awareness</b>	<b>Equipment and Space</b>
	-continue body scaling equipment to student size -smaller team and body sizes require smaller fields of space to avoid locomoting too far (fatigue) -varying field size (boundaries) can create easier or more difficult game situations, depending on the game
	-teach simplified tactics: maintaining possession, penetration and attack, start and restart play, and defense and goal tending -ensure students can maintain possession with control -tactical complexity can improve with addition of defenders (cold vs. warm defenders, learning to penetrate with defenders, etc.) and marking and guarding -emphasize transition from defense to offense
<b>Decision Making</b>	-decision making becomes more of an emphasis than in lower elementary since upper-elementary students develop the ability to conceptualize differing game forms and game categories -emphasize the use of combinations of skills in appropriate situations more often than making actual decisions (e.g., focus on trapping, controlling, and dribbling ball away from defender instead of "moving to open space")
<b>Situated Skill Execution</b>	-ensure students' motor skill development is relatively consistent and coordinated (e.g., can control a ball) prior to game play to allow for continuous (limited start and stopping time) game play -use movement concepts (for example, space, effort, and relationships) to vary skill development and transfer based on the context of the game. E.g., dribbling at different speeds, in different pathways, and in relation to other people or things (defenders or cones) -combine skills for contextualized (game-like) practice (e.g., moving a ball through space by dribbling and passing) -skills should be performed in more open and less predictable environments for authentic skill performance



<b>Performance and Transfer</b>	<ul style="list-style-type: none"> <li>-introduce transfer of skills and tactics across a variety of games</li> <li>-discuss how varying game conditions relate to decision making (within and across games)</li> <li>-change the game, equipment, and game conditions every two days to allow students to practice transferring knowledge and skills (Mitchell, Oslin, &amp; Griffin, 2003)</li> </ul>
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### 4.3. Game Play at the Middle School (Grades 6-8; ages 11-13) and High School Level (Grades 9-12; ages 14-18)

Games are more complex at the middle and high school levels, still requiring a great deal of cooperation among students but most often emphasizing competition against other players and teams. With more game-like organization and purposeful positioning and player roles, strategies become very important for solving tactical problems. Thus, players rely on the cognitive development of abstract thinking, considering other's perspectives, and anticipation and future planning (Butler & Griffin, 2010). Games often resemble actual sport-like games at these levels and are typically broken into games classifications (invasion games, net and wall games, target games, and striking and fielding games). With the enhanced cognitive and psychosocial development of adolescents, teachers can depend on students to do all or most of the skill and tactical analysis of game play, predicting which skills need to be practiced and which strategies might solve problems as well as communicating and collaborating with their teammates to improve game performance. Refer to Table 3 for game considerations and modifications appropriate for middle and high school students.

**Table 3.**

#### *Game Considerations for Middle and High School Students*

<b>Game</b>	<b>Expectations / Class Structure</b>
<b>Appreciation</b>	<ul style="list-style-type: none"> <li>-continue "play, practice, play" structure</li> </ul>
	<b>Rules</b>
	<ul style="list-style-type: none"> <li>-manipulate game forms and conditions to represent authentic versions</li> <li>-modify rules and methods of scoring to create situations in which either the offense or defense is disadvantaged, based on the focus of the lesson. For example, to practice an offensive strategy, disadvantage the defense (2v1) so that the offense has an easier time (but not too easy) to practice the strategy.</li> <li>-introduce the different game positions (e.g., a striker in soccer, forward in basketball) and their characteristics within a game since older students have more abstract thinking ability</li> <li>-promote player and team responsibility and dependability</li> <li>-timing of initial game play should only be long enough to discover the tactical problem before moving onto tactical awareness and situated skill execution</li> </ul>
	<b>Equipment</b>
	<ul style="list-style-type: none"> <li>-modify equipment to elicit different elements of game play (smaller and heavier equipment may be introduced, depending on game) to speed up or change game play</li> </ul>
<b>Tactical</b>	<ul style="list-style-type: none"> <li>-relate tactical problems across varying games for easy transfer</li> </ul>

<b>Awareness and Decision Making</b>	<ul style="list-style-type: none"> <li>-differentiate between tactical problems, strategies, and skills, with tactical problems and appropriate strategies as the focus (unlike elementary levels)</li> <li>-place responsibility of determining tactical awareness on students</li> <li>-use deliberately planned and sequenced guided questions</li> <li>-allow ample time to critically think and analyze game play while communicating with teammates. Encourage effective communication, cooperation, and problem-solving skills.</li> <li>-expect younger learners to have trouble anticipating movements of others, social barriers, and tensions inducing stress among peers when detecting tactical problems and discussing potential solutions</li> <li>-older adolescents can be taught using more of a facilitation approach, compared to younger adolescents</li> </ul>
<b>Situated Skill Execution</b>	<ul style="list-style-type: none"> <li>-promote the use of combinations of skills in varying contexts as solutions to tactical problems</li> <li>-refine motor skills to be applicable to games by varying speed, force, direction, and accuracy</li> <li>-teach skills in game-like contexts and in relation to tactical problems and solutions</li> </ul>
<b>Performance and Transfer</b>	<ul style="list-style-type: none"> <li>-by this time, students should have a repertoire of tactical and strategic solutions to tactical problems across a variety of game categories</li> <li>-ensure students can recall and apply a variety of motor skill combinations and environments to many game-like contexts and situations</li> </ul>

## 5. CONCLUSION

Developmentally appropriate instruction includes the consideration of individual student constraints across all grade levels. Expectations at the different levels of schooling are based on learner developmental needs regarding cognition, psychosocial abilities, physical, and motor development. Only through the complete understanding of students' developmental needs will teachers be able to effectively plan for a successful learning environment. To summarize, there is a need to simplify and modify games to be developmentally appropriate for the age-level learner such that the focus is not only on skill development but also the understanding of why certain skills is necessary in different contexts (tactical awareness).

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None.

### 6.2. Conflict of Interest

There are no conflicts of interest.

### 6.3. Contribution of Authors

JF: Manuscript preparation, manuscript editing

ED: Manuscript preparation, manuscript editing

KD: Manuscript editing

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