Chapter 15
Assessing Declarative Tactical Knowledge in Physical Education: Theoretical Model and Practical Perspectives

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ABSTRACT

The chapter seeks to resolve two important educational issues in order to make the use of tactical knowledge assessment tools simple and intuitive: 1) How can we characterize and contextualize the definition of tactical knowledge in the learning environment? 2) What are the tools adequate to assess the students' development related to the tactical knowledge in a simple and ecological way? Replies to these questions are proposed alongside the four sections of this chapter. The first one introduces the auxology of cognitive development through Jean Piaget's theory of developmental stages. The second section focuses on cognitive learning in physical activity and sports sciences. The third section provides a definition of the proceduralization of declarative tactical knowledge (DTK) in open-skill sports. The fourth section provides the readers with some practical suggestions about the procedures for assessing students' development related to the cognitive domain and presents some tools for measuring the DTK level among students and players.

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INTRODUCTION

Stages of Cognitive Domain Development

Learning is a process that characterizes people's everyday life—in fact, people learn mental skills, attitudes, and physical skills during all activities. In particular, in 1956, a group of researchers led by Benjamin Bloom classified three learning domains (Hoque, 2016): the cognitive domain (knowledge), psychomotor domain (ability), and affective domain (attitudes).

It is well known that physical activity and sport can provide development opportunities in all three of the areas listed above. Having this awareness is essential for all physical education teachers. However, these teachers often grant great importance to the technical aspects of performance, at the expense of the cognitive component. Learning processes in the cognitive domain concern, for example, information-processing, understanding, knowledge-development, and problem-solving skills. In particular, Bloom's taxonomy identifies six levels of cognitive complexity (Hoque, 2016):

1. Knowledge: the ability to retrieve data and/or information;
2. Understanding: the ability to master the meaning of what one knows;
3. Application: ability to use knowledge in a new situation;
4. Analysis: ability to differentiate facts and opinions;
5. Synthesis: ability to integrate different elements to create a new structure; and
6. Evaluation: the capacity to develop judgments.

Yet, why do physical education and youth sport training programmes not take all of these aspects into account in their offerings?

Sport performance requires high levels of competence in performing tasks along with strict time constraints and continuous interactions with objects and opponents (Hodges et al., 2006). Such situations require athletes to determine others' intentions and formulate an appropriate response. Therefore, it is essential that players learn to adapt their performances to each task's constraints and to acquire knowledge structures and cognitive processes so that they can anticipate any environmental variations (Williams et al., 2012). Uncertainty is strongly linked to reaction time, but to reduce it and improve one's performance, a player must appropriately identify environmental constraints and develop an effective decision-making process (Gréhaigne et al., 1999). Accordingly, developing a complete learning experience for all subjects in training (students, new athletes, etc.) is mandatory, including activities aimed at improving analytical, creative, and evaluative thinking skills.

The latter assumption is also expressed within the long-term athlete development (LTAD), an innovative Canadian model representing the stages of the human development process from a physical and sport education perspective. The athlete becomes the centre of the training system, which adapts to their physical, cognitive, and emotional development phases rather than their chronological age (Balyi et al., 2013).

In particular, with respect to the evolution of the cognitive domain, the Canadian model refers to the stages of development theorized by Jean Piaget (1896–1980). He was one of the best-known authors to have studied and theorized on human cognitive development. In fact, he was interested in understanding how people adapt their behaviour to the environment and highlighted how development is a sort of