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## The importance of self-regulated learning of motor and sport skills in physical education

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### Abstract

Self-regulated learning (SRL) includes the cognitive, metacognitive, behavioral, motivational, and emotional/affective aspects of learning. It is, therefore, an extraordinary umbrella under which a considerable number of variables that influence learning (e.g., self-efficacy, volition, cognitive strategies) are studied within a comprehensive and holistic approach. For that reason, SRL has become one of the most important areas of research within educational psychology. First, a brief overview of self-regulated learning is provided focusing on social cognitive models of self-regulation development. Then, research conducted in physical education settings adopting a social cognitive perspective of self-regulated learning is reviewed. Research findings support the effectiveness of the four-level training model of self-regulation development. According to this model, students learn effectively motor and sport skills when they experience sequentially observational, emulative, self-controlled, and self-regulated learning.

**Keywords:** Self-regulated learning, self-regulation, metacognition, socially shared regulated learning, shared regulation of learning, motivation regulation, emotion regulation, learning strategies

### Introduction

**Self-regulated learning (SRL)** is one of the domains of self-regulation, and is aligned most closely with educational aims. Broadly speaking, it refers to learning that is guided by metacognition (thinking about one's thinking), strategic action (planning, monitoring, and evaluating personal progress against a standard), and motivation to learn. "Self-regulated" describes a process of taking control of and evaluating one's own learning and behavior (Panadero, Ernesto (2017) [1]. Mastering motor and sport skills is a complex and demanding process that requires investment of time and exhibition of effort. Development of expertise in sports and physical education requires not only innate talent and high level of instruction, but also the development of self-regulatory skills (Ommundsen & Lemyre, 2007; Zimmerman & Kitsantas, 2005) [4]. Therefore, the examination of the self-regulated learning development in sports and physical education is of great interest.

### What is self-regulated learning

Self-regulated learning is an active, self-directive process whereby students monitor, regulate, and control their cognition, motivation, affect, behavior, and environment to achieve their goals (Efklides, Niemivirta, & Yamauchi, 2002) [7]. Self regulation refers to "self-generated thoughts, feelings, and actions that are planned and cyclically adapted to the attainment of personal goals" (Zimmerman, 2000, p. 14) [8] and involves goals, motivational beliefs and self-initiated learning processes such as powerful strategies for attaining these goals (Zimmerman & Cleary, 2009). Key components of self-regulated learning are cognition, metacognition, motivation, affect, and volition (Boekaerts, 1996; Efklides, 2011) [11, 6].

### Models of self-regulated learning

Various models have been proposed to explain how students can self-direct their own learning to become self-regulated learners. For example, Puustinen and Pulkkinen (2001) [9] reviewed five self-regulated learning models that have been considerably developed and supported by several empirical studies. These models were developed by Boekaerts (Boekaerts & Niemivirta, 2000) [7], Borkowski (1996) [5], Pintrich (2000) [10], (Winne & Hadwin, 1998), and

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Zimmerman (2000) [8]. The theoretical background was an important differentiating feature of these models. For example, only two of the models were similar because their authors (i.e., Pintrich and Zimmerman) adopted the same background theory, the social cognitive theory. Two kinds of self-regulated learning definitions emerged from these models, a goal-oriented (Boekaerts, Pintrich, and Zimmerman) and a metacognitively weighted definition (Borkowski and Winne). Moreover, all the authors assumed self-regulated learning to proceed from some kind of a preparatory phase, through the actual performance or task

completion phase, to an appraisal or adaptation phase. However, the components of each model and the relative weight given to each of these components vary. For example, Boekaerts' model mainly focuses on the preparatory phase of the self-regulated learning process and less on the performance and the appraisal phases. Moreover, Boekaerts and Pintrich are mainly motivation oriented in their research whereas Borkowski's and Winne's research is principally strategy oriented. Zimmerman's research has been both motivation and strategy oriented.

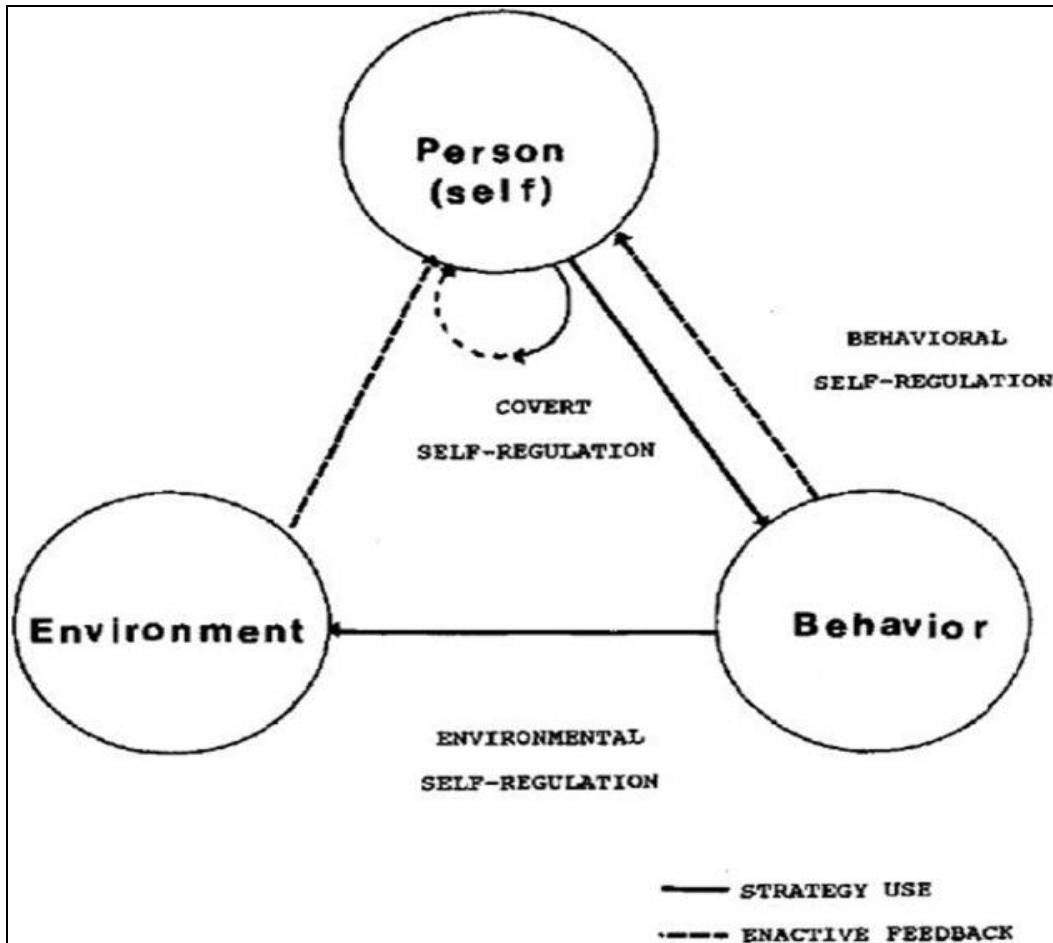


Fig 1: (Represent Triadic model of SRL. Adapted from Zimmerman, 1989) [13].

**Social cognitive perspective of self-regulated learning**  
**The cyclical model of self-regulated learning**

From a social cognitive perspective (Zimmerman, 2000) [8], self-regulatory processes and associated beliefs interact in three cyclical phases: forethought, performance, and self-reflection. The forethought phase precedes students' engagement in a task and includes task analysis (e.g., goal setting) and self-motivational beliefs (e.g., self efficacy).

During the performance phase students perform the task, observe their own performance and use self-control strategies to facilitate the attainment of their goals. The self-reflection phase involves self-judgment (e.g., causal attribution) and self reaction (e.g., self-satisfaction) processes. This view of self-regulation is cyclical in that processes, beliefs, and self-reflections in each phase can affect efforts to learn during subsequent phases (Zimmerman, 2002).

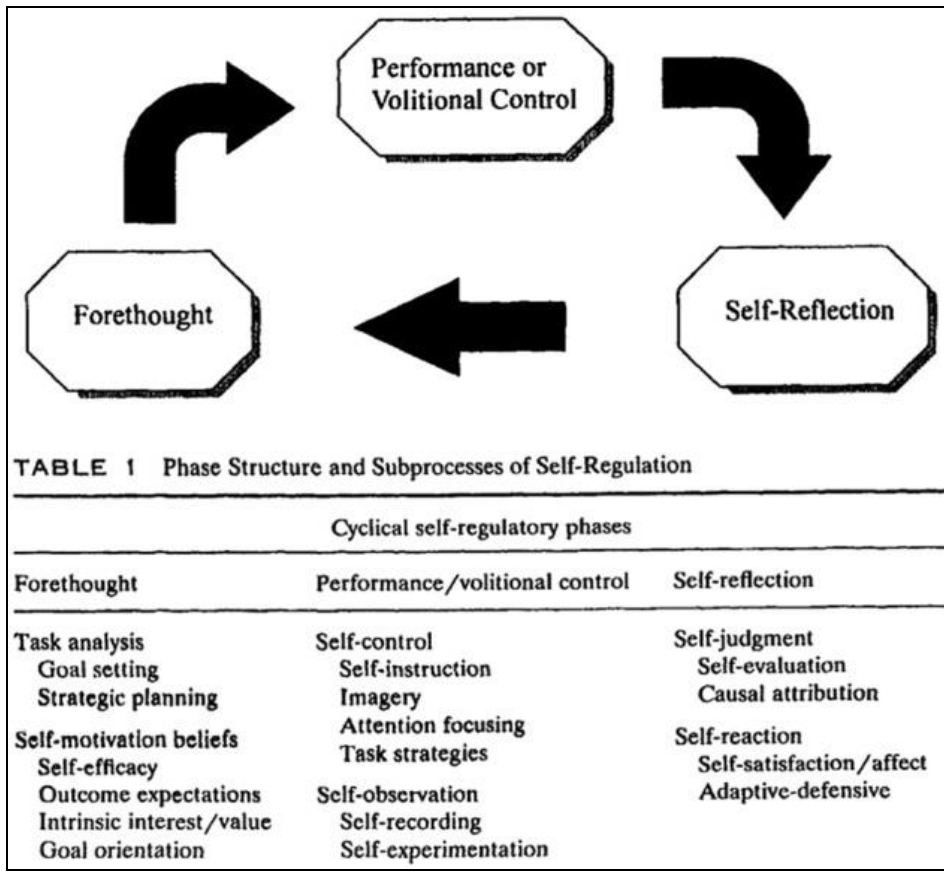


Fig 2: (Represent Cyclical phase model 1<sup>st</sup> version. Adapted from Zimmerman, 1989) [13].

As one of the most prolific SRL writers, Zimmerman has developed three models of SRL (Panadero and Alonso-Tapia, 2014) [14]. The first model (Figure 1) known as the Triadic Analysis of SRL, represents the interactions of three forms of SRL: environment, behavior and person level (Zimmerman, 1989) [13]. This model describes how SRL could be envisioned within Bandura’s triadic model of social-cognition. The second model (Figure 2) represents the Cyclical Phases of SRL, which explains at the individual level the interrelation of metacognitive and motivational processes. This model was presented in a chapter in the 2000 handbook, and it is usually known as Zimmerman’s model. There the subprocesses that belong to each phase were presented, but it was not until 2003 that these subprocesses were embedded in the figure (Zimmerman and Campillo, 2003) [15].

**Self-regulated learning in physical education**

Learning motor and sport skills is a major aim of physical education. However, available resources, materials, and facilities as well as instructional time devoted to physical education are often limited (Ennis, 2006) [12]. Therefore, the most effective approaches for promoting learning and performance should be adopted. Recently, the development of self-regulated learning has drawn a lot of attention in academic settings (Efklides, 2005). The present study adopted a social cognitive perspective (Zimmerman, 2000) [8] to examine the development of self-regulated learning of a sport skill in elementary physical education.

**Key component of self-regulated learning**

- Goal setting
- Teaching style
- Self-talk
- Calibration

**Conclusions**

The research findings reviewed in this article showed that the four-level training model of self-regulation development (Zimmerman, 2000) [8] is an effective approach of promoting self-regulation in physical education. However, further evidence regarding the effectiveness of this model is needed. The four-level training model can become an instructional approach for teaching motor and sport skills in sports and physical education contexts. Using this approach, physical educators should help their students to learn effectively and to become autonomous and self-regulated learners.

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