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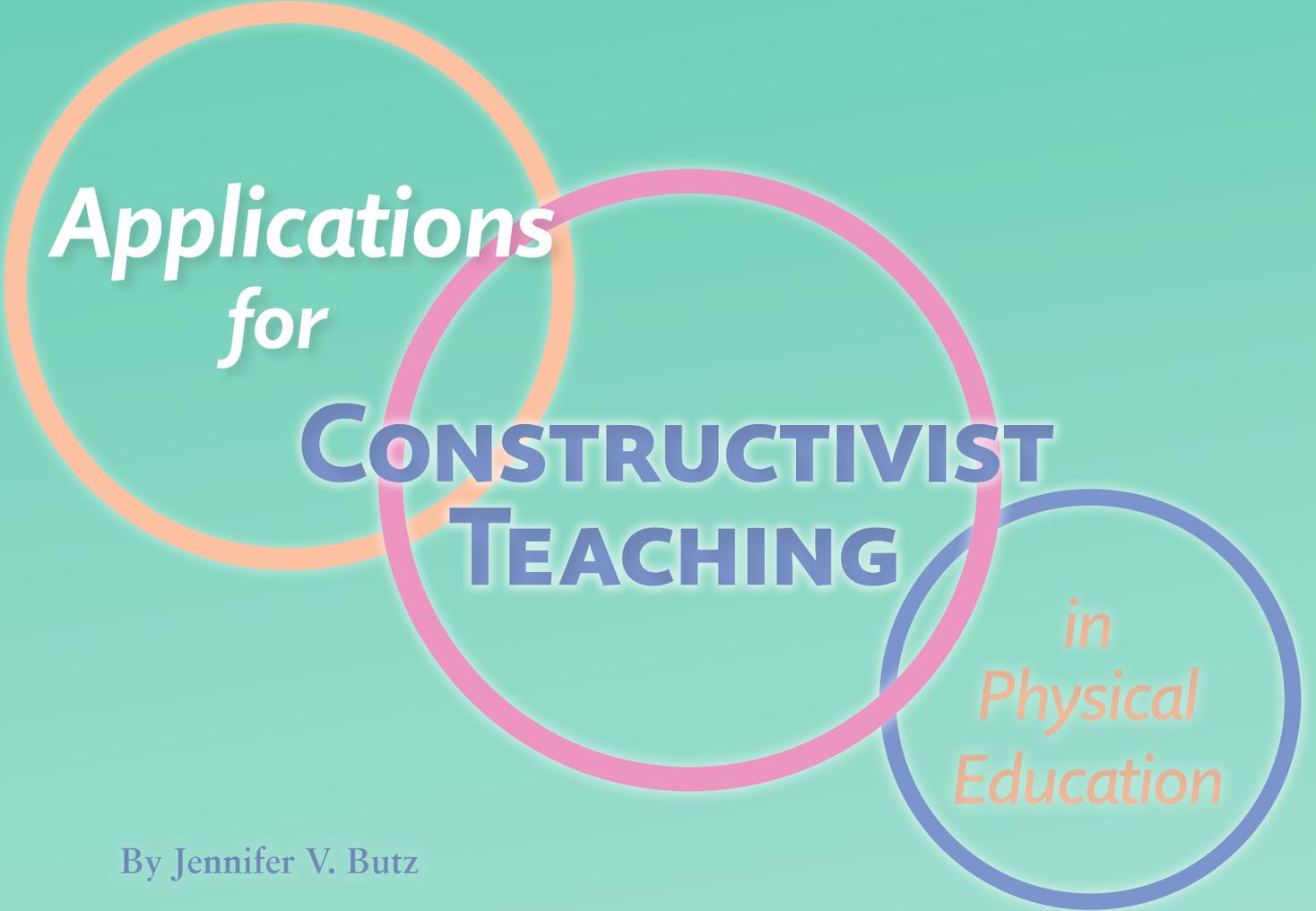
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Applications for

CONSTRUCTIVIST TEACHING

in Physical Education

By Jennifer V. Butz

The learning environment in the physical education classroom has changed dramatically since the start of the 21st century. Once a sports and recreation-based class, physical education has transformed into a content area focused on behavioral changes and lifelong healthful living (Committee on Physical Activity and Physical Education in the School Environment, Food and Nutrition Board, & Institute of Medicine, 2013; Ennis, 2014). Such a drastic change in instructional practice did not happen by mere chance but instead as a reaction to health trends. A driving force of this change was the growing obesity rate among children and youth in the United States. This rate more than doubled during the past 30 years to a staggering 12.7 million (Centers for Disease Control and Prevention [CDC], 2016). The ever-rising obesity rate among youth in the United States is a distressing issue that needs to be formally addressed.

With adolescent students spending the majority of their waking hours in an educational setting (U.S. Department of Health and Human Services, 2016), focusing on this issue in school-based environments is the most effective means of addressing the obesity epidemic. Physical educators attempted to address these individual student needs through physical education reform. The addition of academic standards for physical education validated the standards-based school reform efforts at both the state and national levels. Physical educators now had the task of addressing the cognitive, affective and psychomotor domains for learning, while addressing content-driven standards (SHAPE America – Society of Health and Physical Educators, 2014). Assessing other learning areas besides student skill performance was a new concept in physical education. The demand to increase student knowledge while fostering the development of personal understanding of content was a challenge best suited for constructivist learning theory (Sun, Chen, Zhu, & Ennis, 2012).

By integrating genuine learning tasks that promoted lifelong health-related fitness in the physical education curriculum, students had greater ownership of new content and activities as they developed a deeper personal connection to the

subject area (Sun et al., 2012). These learning tasks can help foster the understanding of knowledge and skills, which can be transferred into different facets of the student's life. This change allows for constructivist-based teaching practices, once reserved for core-content subject areas, to emerge within the physical education environment.

This article begins with a review of contemporary physical education practices. An overview of constructivism and current views of constructivist teaching practices in physical education follows, along with examples of how constructivism can be integrated into the modern physical education classroom.

Contemporary Practices in Physical Education

Important changes in physical education practices created a need for SHAPE America to revise the mission statement of physical education. The new mission of physical education is to assist in the development of “motor skills, knowledge, and behaviors for healthy, active living, physical fitness, sportsmanship, self-efficacy, and emotional intelligence” (SHAPE America, 2015, p. 3). Through proper physical education instruction, “physically literate individuals” can emerge (SHAPE America,

2014). With a new mission, sports- and movement-based instructional models of physical education are no longer considered adequate because they do not give students an opportunity to gain knowledge on fitness-related content and fitness-improving exercises, which are critical in the development and maintenance of healthy living habits (CDC, 2013; Corbin, Le Masurier, & Lambdin, 2007; Sun et al., 2012).

Contemporary physical education practices are placing more emphasis on individual health-related fitness and less emphasis on traditional sports-based units (Ennis, 2014). The addition of health-related fitness and skills has assisted in instilling healthy lifestyle habits among students in all settings, both primary and secondary. In addition to knowledge acquisition, students learn fitness-monitoring and goal-setting skills to further strengthen their personal connection to the content. Studies have shown that students often benefit from changes in the school curriculum, including the addition of health-related physical education (Dobbins, Husson, DeCorby, & LaRocca, 2013; Sun et al., 2012; Waters et al., 2011). Several studies involving aspects of health-related physical education have cited gains in students' cognitive function and academic achievement (Castelli, Hillman, Buck, & Erwin, 2007; Martin, Saunders, Shenkin, & Sproule, 2014; Rasberry et al., 2011).



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Constructivism Overview

Following the ideals of John Dewey, constructivism theory is based on the idea that students should engage in learning that is relevant to their own lives because it carries deeper meaning and understanding (Gay, 2011; Sternberg & Lubart, 2011; Wiggins, 2011). Building on prior student knowledge and experiences is vital in the construction of student understanding (Eggen & Kauchak, 2013). Students in constructivist-based classrooms become active participants in the learning processes as they construct their own understanding of concepts, rather than having their learning transmitted to them by some other source (Eggen & Kauchak, 2013; Thomas, Lee, & Thomas, 2008). Through the use of genuine learning tasks that are both health-promoting and cognitively engaging, deep connections can be made to content that students can apply to their own lives (Azzarito & Ennis, 2003; McKenzie & Lounsbury, 2013). The relationship between the health-related fitness model and constructivism is evident when considering the desired outcome of instruction. The health-related fitness model is focused on the acquisition of knowledge, skills and behaviors that last a lifetime. Constructivist learning theory can enhance this model through instruction that allows for deeper and more personal connections with content.

Two Views of Constructivism

There are two very distinct views of constructivism: cognitive constructivism and social constructivism. Aspects of each of these views are present in health-related fitness models.

Cognitive constructivism theory, influenced by the work of Jean Piaget (1926), supports that human inquiry is embedded within individuals. In this learner-centered approach, the student creates internal constructs of knowledge and skills from previous experiences by testing and modifying previously established schemas. This accommodation and assimilation process happens as experiences are encountered. Students take on the role of scientists by applying knowledge, skills and concepts to real-world tasks.

In cognitive constructivism, learners pass through stages of cognitive development at different rates and therefore allow a new means of processing information to emerge. Once a developmental stage is entered, reverting to a previous stage of development, or skipping a stage entirely, is not possible. An example of this theory's application to health-related fitness could involve students identifying the difference between muscular strength and muscular endurance fitness activities. Students would activate their prior knowledge of and experiences with such activities to assist in identifying the fitness-related activity.

Social constructivism, which was influenced by the work of Lev Vygotsky (1978), emphasizes the role that culture plays in cognitive development. Human inquiry is embedded within the culture and knowledge is acquired through the environment (Mayer, 2008). Knowledge is first constructed in a social context before being internalized by the learner. Language serves as a means of developing cognition and critical thought (Dahl, 2004; Pound, 2013). Cognitive development occurs in four stages (i.e., sensorimotor, preoperational, concrete operational, and formal operational), which are based on the connection between the learners' thoughts and language. Regression



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Table 1. Cognitive Theory

National Standard 3: The physically literate individual demonstrates the knowledge and skills to achieve and maintain a health-enhancing level of physical activity and fitness (SHAPE America, 2015).		
Instructional Strategy	Activity	Assessment
Authentic learning experiences	Students use heart rate monitors to measure active heart rates during various health-related fitness activities.	Students document their heart rate for each health-related fitness activity to determine which activities increase and decrease heart rates the most while they are physically active.
Differentiating instruction	Students are provided with a variety of ways to connect with content. Students can create, research or implement a personalized fitness program and document the effects on overall and specific areas of health-related fitness.	Students are given multiple options to complete a summative assessment for an academic standard. Teachers use the student-selected assessment to evaluate an academic standard.
National Standard 2: The physically literate individual applies knowledge of concepts, principles, strategies and tactics related to movement and performance (SHAPE America, 2015).		
Instructional Strategy	Activity	Assessment
Writing across the curriculum	Students journal about how they (or someone they know) could increase their cardiovascular fitness levels.	The teacher uses a rubric to determine if all aspects of the writing prompt are met.

to a previous developmental stage can occur depending on the difficulty level of the cognitive task. Vygotsky also emphasized the zone of proximal development as a form of scaffolding to assist the student in gaining content knowledge that may have been too difficult to attain alone. In this theory, interactions with more knowledgeable individuals play a vital role in the acquisition of content through teacher–student and student–student interactions (Darinis-Paraboschi, Lafont, & Menaut, 2005). One example of the application of this theory in relation to health-related fitness could involve students calculating their body composition. The scaffold could be as simple as the use of a worksheet that identifies the specific data needed in each formula. Additional supports could include direct step-by-step instruction. The teacher or a student’s peers could assist in completing each formula.

Constructivist Teaching in Physical Education

Constructivism is a theory that addresses the unique needs for the development of physically literate individuals. Physical literacy is “the ability, confidence, and desire to be physically active for life” (The Aspen Institute, 2015, p. 9). Teachers can meet the varying needs of all students by utilizing constructivist teaching practices. This learning theory also addresses the unique backgrounds and experiences of students themselves. A student-centered approach allows for a variety of connections,

both social and personal, to be made to the content (Ennis, 2014). These connections allow the student to form a deeper and more personal understanding of the content (Azzarito & Ennis, 2003; McKenzie & Lounsbery, 2013; Sun et al., 2012).

Practical Implications in the Physical Education Classroom

Both views of constructivism, the cognitive theory of development and social development theory, have practical applications within the physical education classroom. The following examples employ the health-related fitness model to demonstrate relevant applications of constructivism-based teaching practices. Specific examples of practical implications for both the cognitive theory of development (Table 1) and the social development theory (Table 2) are provided.

Implementing teaching strategies based on the cognitive learning theory mentioned in Table 1 can address National Standards 2 (i.e., “The physically literate individual applies knowledge of concepts, principles, strategies and tactics related to movement and performance”) and 3 (i.e., “The physically literate individual demonstrates the knowledge and skills to achieve and maintain a health-enhancing level of physical activity and fitness”; SHAPE America, 2015, p. 2). Once a student has achieved this physical literacy through constructivist theory-based education, the student will be able to utilize these skills throughout his or her life.

Table 2. Social Development Theory

National Standard 4: The physically literate individual exhibits responsible personal and social behavior that respects self and others (SHAPE America, 2015).		
Instructional Strategy	Activity	Assessment
Tracking student progress	The teacher uses a graph to track class PACER scores throughout the year. Students work toward a preset goal throughout the year.	The chart serves as a means of documenting student/class improvement and achievement of fitness-related goals.
Collaborative activities	Students work with a group to create and play a game that is related to one or more areas of health-related fitness.	Students complete a personal reflection on their group's performance regarding interactions and collaboration during class activities.
Peer evaluation	Students evaluate each other's barbell squats. They use teacher-given instructional cues to evaluate their peers' competency with this skill.	Students complete a peer check sheet for their partners. They check off specific techniques that their partners completed when performing the assigned skill. Students use the feedback provided by their peers to improve their performance through self-reflection.

Note. PACER = Progressive Aerobic Cardiovascular Endurance Run.

The cognitive theory of development can be addressed within a classroom setting with authentic learning experiences through the use of real-world events and meaningful practice. For instance, students can utilize heart rate monitors to analyze

their predictions regarding active heart rates. Students can use the heart rate data they collect to hypothesize which fitness-related activities increase heart rates and which activities decrease heart rates. The students could then brainstorm and list activities in which they engage every day that might similarly affect their heart rate. Such higher-order thinking activities are often not found in traditional sports-based instruction (Ennis, 2014). By integrating authentic learning activities into the physical education curriculum, students have greater ownership of new content and activities and will develop a deeper personal meaning (Sun et al., 2012).

Differentiating instruction is another means of addressing the cognitive theory of development. Students pass through the stages of cognitive development at different rates. Through assimilation and accommodation of new content, learners construct their own understanding of new material. To account for varying backgrounds, the teacher provides multiple examples and representations of content, so students can construct a deeper understanding (Eggen & Kauchak, 2013). For instance, the instructor might allow students to choose from a variety of summative assessments to evaluate an academic standard. Students could create, research or implement a personalized fitness program. They could then document and describe the benefits of the chosen program on overall and specific areas of health-related fitness.

Lastly, content area literacy can be addressed through the cognitive theory of development. Promoting content area literacy through journal writing allows students to engage in personal reflection on their fitness journey. When students keep a detailed fitness journal, they have a record of their advancement

The health-related fitness model is focused on the acquisition of knowledge, skills and behaviors that last a lifetime. Constructivist learning theory can enhance this model through instruction that allows for deeper and more personal connections with content.

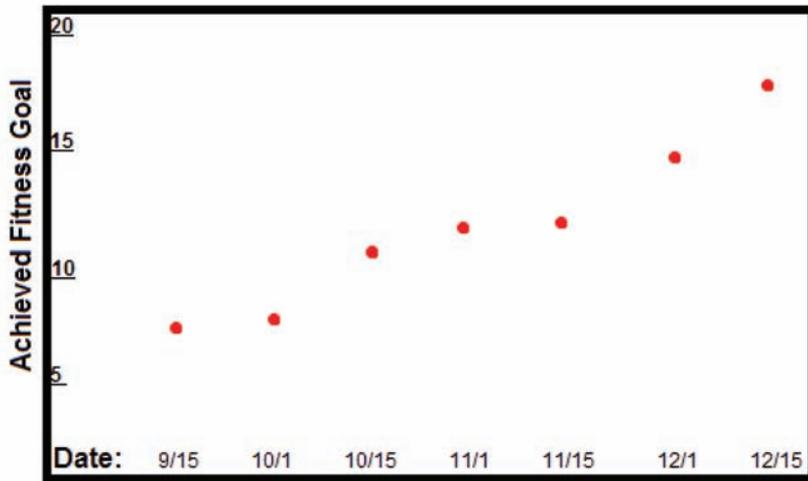


Figure 1. Sample J-chart to track class achievement of fitness-related goals

and are able to see how their later successes are the result of incremental improvements over time. Keeping a journal also encourages critical thinking as students synthesize their learning (Smith, Rook, & Smith, 2007). Promoting the connection between students' home life and school life is beneficial to constructing new meaning (Swafford & Bryan, 2000).

The other constructivist view, social development theory, can be employed in a classroom by creating a positive learning environment. The social development theory-based teaching strategies mentioned in Table 2 may address National Standard 4. National Standard 4 states, "The physically literate individual exhibits responsible personal and social behavior that respects self and others" (SHAPE America, 2015, p. 2). Jenkins (2013) suggested that using a progress chart in classroom instruction to track class goals can help to create a classroom environment in which students work together and are motivated to improve. Figure 1 shows an example of a J-chart that can be used to track class achievement of fitness-related goals. Students who achieve their own personal fitness goals earn points that are applied to the total class score. Their individual or class scores from fitness testing can be used to document individual changes in physical activity levels and effort while engaging in physical activity. Students continue to work throughout the year to obtain a pre-selected goal set by the teacher.

The utilization of collaborative activities for questioning and probing also assists in the application of social development theory in the physical education classroom. As an example, teachers may direct students to discuss with a partner why some people stop being active after high school. "Social interaction in the learning process must be created deliberately as part of the curriculum rather than being left to chance" (Sun et al., 2012, p. 217). Collaborative activities allow students to work through a problem by creating a unique solution. Such interactions help create a community of learning through purposeful activities and active engagement (Sun et al., 2012). For example, as a

group, students could invent a game addressing at least one of the five areas of health-related fitness (i.e., cardiovascular endurance, muscular strength, muscular endurance, flexibility, and body composition). Students can develop and record general guidelines for their game that include rules, number of players, penalties, equipment, boundaries and a diagram of the playing area. Groups can share and receive feedback about their newly created game.

Finally, the implementation of scaffolding and feedback is another practical application of social development theory in the classroom (Ward & Lee, 2005). Scaffolding and meaningful feedback can be provided using the gradual-release-of-responsibility model. This technique utilizes direct, guided and independent practice strategies. During guided practice, students work on a fitness activity in small groups with teacher support. These groups provide one another with specific feedback on a skill or task. Students use

the feedback provided by their peers to improve their performance through self-reflection (Ward & Lee, 2005). Peer evaluation check sheets can be utilized to facilitate this process. For example, this evaluation could be completed during a weight-lifting unit in which students evaluate each other while performing barbell squats. Students complete a performance sheet by identifying the teacher-given cues that their peers completed for the specific activity. One study suggested that students learn more about fitness-related movement and skills when they analyze and provide feedback on a peer's performance (Dyson, 2002).

Conclusion

Physical education reform is not a quick fix for the obesity epidemic and sedentary lifestyles. However, the use of a health-related fitness model and the utilization of constructivist teaching practices allow for deeper student understanding, which can lead to behavior changes (Chen & Ennis, 2004; Reigeluth, 1999; Ryan, 2009). Personal meaning and understanding of content are achieved through the use of instructional activities that are relevant to the lives of students (Gay, 2011; Sternberg & Lubart, 2011; Sun et al., 2012; Wiggins, 2011). Implementing health-related fitness activities could lead to lifelong healthy habits, a characteristic of a physically literate person (SHAPE America, 2014).

As in other curricular areas, physical educators must be willing to change their instructional strategies to meet students' needs. Statistics have demonstrated a need to instill healthy living habits in children and adolescents during this obesity epidemic if there is any hope of helping them avoid health issues in the future. Such an undertaking in a school setting requires physical education reform at the district level, as well as in the classroom.

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