

LINKING
Physical Activity
WITH *Academics:*

STRATEGIES
FOR
INTEGRATION

By Jennifer L. Koch

Many children spend the majority of their school day passively sitting at their desks minimizing movement and maximizing sedentary learning. This type of setting does not meet the needs of students' cognitive function nor does it assist in decreasing the heavily studied childhood obesity epidemic. It is well known that physical activity is a vital component to learning, and current National Association for Sport and Physical Education (NASPE) guidelines recommend that students participate in moderate-to-vigorous physical activity (MVPA) for at least 60 minutes per day (NASPE, 2004), which provides significant benefits. Sadly, most students are

not acquiring enough minutes from physical education or recess in lieu of more academic time, even though time spent in physical education and other physical activity opportunities is not negatively associated with academic performance in other subjects (Ahamed et al., 2007; Carlson et al., 2008; Coe, Pivarnik, Womack, Reeves, & Malina, 2006; Trudeau & Shephard, 2008). The purpose of this article is to highlight the need for physical activity-integrated lessons for classroom teachers, provide strategies for effective integration, and encourage physical education teachers to be an additional resource and an advocate for physical activity in their schools.

When students are engaged in “sedentary learning,” teachers are negatively impacting their overall health and limiting student comprehension through a single dimensional learning style. Although childhood obesity has continued to grasp national attention and interest, seemingly few methods are contributing to a positive change in the obesity epidemic. Based on the tremendous amount of time students spend in schools, initiatives such as *Let’s Move in School* and *comprehensive school physical activity programs* (CSPAPs) are being used to accumulate additional physical activity minutes during the school day and within the classroom. However, even scheduling a few minutes for physical activity breaks can be difficult in standards-based education where teachers have little leniency over whether to cover certain aspects of the curriculum or not. Therefore, it is recommended that classroom teachers integrate physical activity within their lessons, where teachers can still maximize academic learning while also helping to meet physical activity recommendations. Efforts to integrate physical activity within classroom curricula may assist in accumulating physical activity minutes not only recommended, but quintessentially needed by students in K–12 schools.

Defining Integration

Integration has been used interchangeably in different ways, but it is basically bridging or merging of content from multiple academic areas to assist students in seeing the interrelatedness of knowledge (Kovar, Combs, Campbell, Napper-Owen, & Worrell, 2012). An integrated teaching approach has highlighted benefits for students to make connections and strengthen their grasp of content and applicability to an uncompartimentalized world (Brand & Triplett, 2012). Teachers typically schedule math, English, language arts, and science curricula as separate entities. Through the incorporation of physical activity within a standard curriculum, a more conducive learning environment emerges where students become truly *active* participants instead of just participating in the common method of *interactive* teaching.

Benefits of Integrating Physical Activity and Academics

Simple physical activity breaks often used between content (e.g., math or social sciences) or during transitions (individual or group work) are an important component to a functional CSPAP model. Having children engage in physical activity in the classroom creates an opportunity for students to accumulate additional physical activity minutes, especially when recess and physical education are not scheduled or are occasionally lost from the school day. A decrease in neural connections in the brain can occur in as little as 20 minutes of sedentary activity, minimizing attention spans (Kinoshita, 1997). Therefore, it might be advantageous to schedule movement breaks multiple times per day. This strategy enables students to refocus their attention on academic concepts and to experience the neurological and physiological benefits, while unconsciously using it to their advantage in an academic setting. Students have shown better on-task behavior during academic instruction through the incorporation of physical activity breaks (Barros, Silver, & Stein, 2009; Mahar et al., 2006).

Physical activity can be specifically integrated within core curricular lessons by adding movement to learning (e.g., performing jumping jacks during math problems) or purposeful movement when students expressively use their bodies to grasp intangible concepts inscribed throughout their academic work (e.g., using their bodies to make letters or act out a word problem; Beaudoin & Johnston, 2011; Robinson & Goodway, 2009; Shoval, 2011).

Incorporating physical activity within academic curricula may also increase the attention and interest of multiple students. Some students may retract from physical education if they are uncomfortable with physical activity, or if they are uninterested in activities with a “sports-type label.” Other students may be solely motivated by physical activity and anything related to moving and sports. Therefore, bridging content between two types of learning environments may motivate students in dual settings. Motivation for students who dislike the core curriculum may be reversed with the incorporation of “things we do during physical education” and may merge two different student interests. It has also been shown that academic intrinsic motivation and achievement are increased when specifically infused with movement (Vazou, Gavrilou, Marmalaki, Papanastasiou, & Sioumalas, 2012).

When used within an elementary classroom setting, students who spent 50 minutes per week engaged in physical activity scored better on standardized tests in mathematics, reading, and language arts than did students who did not have activity breaks (Ahamed et al., 2007). Simple functions such as memory and the ability to concentrate have also been linked to physical activity (Trudeau & Shephard, 2008). Activity time may vary from 5 to 40 minutes, yet despite the time difference, on-task behavior has increased among students. In addition, when physical activity was combined with a healthy diet, fifth-grade students showed improvement in standardized test scores (Wang & Veugerlers, 2008).

Movement is a nondebatable component for cognition and standard gross and fine motor development. Students are more engaged, on-task, and generally prefer lessons using kinesthetic and tactile components (Ahamed et al., 2007; Beaudoin & Johnston, 2011).

Planning for Integration

For physical activity integration to be successful, collaboration by classroom teachers and physical education specialists is needed. This approach often highlights the experts’ research in specific content and physical activity. For more effectiveness, classroom teachers should develop a generalized understanding of locomotor, nonlocomotor, and manipulative skills (e.g., jumping, galloping, sliding, throwing, dribbling, etc.). This understanding of movement concepts can help teachers create content-specific lessons with movement. For example, teachers can teach first-grade students specific academic concepts while also working on their balance and hopping skills. Creating learning experiences with historical characters such as Harriet Tubman in her efforts to assist with the Underground Railroad may help students retain academic content while performing locomotor skills (e.g., slide along the Charles River, run along the Great Dismal Swamp, etc.). This approach might also prompt students to use their imagination and foster their own learning. However, if physical education teachers expect classroom teachers to integrate physical activity

into their classroom-based lessons, similarly, physical education teachers should integrate academic concepts in areas pertaining to social studies, science, English, language arts, and math in their physical education lessons.

Physical Activity-Integrated Lessons

Finally, although teachers often recognize the importance of physical activity-integrated lessons, many are not familiar with activities or ways to infuse physical activity with academic content. The following samples are intended to stimulate one's thoughts for ways to create physical activity-integrated lessons.

Math-Bo (Math)

Using various fitness movements for math problems, students can create their own "math-bo" workout. Teachers can assign each math function as an activity (addition, punching; subtraction, knee lifts; multiplication, upper cut; division, hook). Then, teachers compile several PowerPoint slides with a different equation on each slide (e.g., 2×4 , $6 + 6$, $12 - 2$, or $20/2$). Teachers then have students bounce in place (like a boxer) and for each function have the students perform that equation. For example, using $3 \times 3 = 9$, the students perform three upper cuts, show the "X" sign with their arms, perform three more upper cuts, show the equals sign using their arms, and perform nine more upper cuts for the answer.

Capital Direction (Social Studies)

The teacher posts a picture of the United States so all students can see it, with a starred location (i.e., you are here). The teacher then names a capital city of one state and students locate the direction of that particular state, while performing the assigned movement to get there (e.g., North, jump 10x; South, squats 10x; East, swim in place for 10 seconds; West, jog in place for 10 seconds; Northeast, stretch up high for 10 seconds; Northwest, lunges for 10 seconds; Southeast, pushups for 10 seconds; Southwest, curl-ups for 10 seconds).

How Does It Matter? (Science)

Students will use purposeful movement to explore the various states of matter (solid/liquid/gas). Students then begin with the human knot (reaching across a circle and grasping someone else's hand). This state represents a solid because students cannot move freely and are essentially "tightly woven" together. Once the students unravel from the human knot, they remain linked with each other to form an asymmetrical shape. This state represents a liquid because they can move more quickly than a solid, but not as quickly/freely as a gas. Finally, students as individuals run or walk around the open space illustrating the gaseous state. This enables them to quickly move as a single unit, much like a gas.

Linking physical activity with academics is certainly a viable method for increasing student learning and promoting additional amounts of physical activity among K-12 students. Physical education teachers can assist classroom teachers with the development and guidance needed to promote movement with the classroom. Effectively implementing movement into classroom lessons not only increases the number of physical activity minutes

a child receives each day, but also fosters creativity, cognitive development, and motivation for student learning.

References

- Ahamed, Y., Macdonald, H., Reed, K., Naylor, P. J., Liu-Ambrose, T., & McKay, H. (2007). School-based physical activity does not compromise children's academic performance. *Medicine and Science in Sports and Exercise*, 39(2), 371-376.
- Barros, R. M., Silver, E. J., & Stein, R. (2009). School recess and group classroom behavior. *Pediatrics*, 123, 431-436.
- Beaudoin, C. R., & Johnston, P. (2011). The impact of purposeful movement in algebra instruction. *Education*, 132(1), 82-96.
- Brand, B. R., & Triplett, C. F. (2012). Interdisciplinary curriculum: An abandoned concept? *Teachers and Teaching: Theory and Practice*, 18(3), 381-393.
- Carlson, S. A., Fulton, J. E., Lee, S. M., Maynard, M., Brown, D. R., Kohl, H. W., et al. (2008). Physical education and academic achievement in elementary school: Data from the Early Childhood Longitudinal Study. *American Journal of Public Health*, 98(4), 721-727.
- Coe, D. P., Pivarnik, J. M., Womack, C. J., Reeves, M. J., & Malina, R. M. (2006). Effect of physical education and activity levels on academic achievement in children. *Medicine & Science in Sports & Exercise*, 38, 1515-1519.
- Kinoshita, H. (1997). Run for your brain in mind. *Brainwork*, 7(1), 8.
- Kovar, S. K., Combs, C. A., Campbell, K., Napper-Owen, G., & Worrell, V. J. (2012). *Elementary classroom teachers as movement educators*. New York: McGraw-Hill.
- Mahar, M. T., Murphy, S. K., Row, D. A., Golden, J., Shields, A. T., & Raedeke, T. D. (2006). Effects of a classroom-based program on physical activity and on-task behavior. *Medicine and Science in Sports & Exercise*, 38(12), 2086-2094.
- National Association for Sport and Physical Education. (2004). *Physical activity for children: A statement of guidelines for children ages 5-12* (2nd ed.). Reston, VA: Author.
- Robinson, L. E., & Goodway, J. D. (2009). Instructional climates in preschool children who are at-risk. Part I: Object-control skill development. *Research Quarterly for Exercise and Sports*, 25, 533-542.
- Shoval, E. (2011). Using mindful movement in cooperative learning while learning about angles. *Instructional Science*, 39, 453-466.
- Trudeau, F., & Shephard, R. J. (2008). Physical education, school activity, school sports and academic performance. *International Journal of Behavioral Nutrition and Physical Activity*, 5(10), 1-12.
- Vazou, S., Gavrilou, P., Mamalaki, E., Papanastasiou, A., & Sioumala, N. (2012). Does integrating physical activity in the elementary school classroom influence academic motivation? *International Journal of Sport and Exercise Psychology*, 10(4), 251-263.
- Wang, F., & Veugerlers, P. J. (2008). Self-esteem and cognitive development in the era of the childhood obesity epidemic. *Obesity Reviews*, 9(6), 615-623. **S**

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Additional Resources

- Active Academics: <http://www.activeacademics.org>
- Brain Breaks: <http://www.emc.cmich.edu/BrainBreaks/default.htm>
- Elementary Energizers: <http://www.eatsmartmovemorenc.com/Energizers/Texts/K-5-Energizers.pdf>
- Middle School Energizers: <http://www.eatsmartmovemorenc.com/Energizers/Middle.html>
- Take 10!: <http://www.take10.net>

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