



## Why We Should Not Cut P.E.

Eliminate physical education to increase time for reading and math, the theory goes, and achievement will rise. But the evidence says otherwise.

*Stewart G. Trost and Hans van der Mars*

Thinking of cutting physical education? Think again. Even as we bemoan children's sedentary lifestyles, we often sacrifice school-based physical education in the name of providing more time for academics. In 2006, only 3.8 percent of elementary schools, 7.9 percent of middle schools, and 2.1 percent of high schools offered students daily physical education or its equivalent for the entire school year (Lee, Burgeson, Fulton, & Spain, 2007).

We believe this marked reduction in school-based physical activity risks students' health and can't be justified on educational or ethical grounds. We'll get to the educational grounds in a moment. As to ethical reasons for keeping physical activity part of our young people's school days, consider the fact that childhood obesity is now one of the most serious health issues facing U.S. children (Ogden et al., 2006).

School-based physical education programs engage students in regular physical activity and help them acquire skills and habits necessary to pursue an active lifestyle. Such programs are directly relevant to preventing obesity. Yet they are increasingly on the chopping block.

### The Assumption: Time in the Gym Lowers Test Scores

No Child Left Behind (NCLB) has contributed to this trend. By linking federal funding to schools' adequate yearly progress in reading and mathematics, NCLB has created an environment in which such classes as physical education, music, and art are viewed as nonessential and secondary to the academic mission of the school.

According to a national study conducted by the Center on Education Policy in 2007, since the passing of NCLB in 2002, 62 percent of elementary schools and 20 percent of middle schools have significantly increased the instructional time they allocate to reading/language arts and math. To accommodate such increases, 44 percent of school districts reported cutting time in such areas as social studies, art, music, physical education, and recess. On average, schools reduced the time allotted to these subjects by more than 30 minutes per day.

But is the assumption that eliminating physical education improves academic performance sound? Not according to the evidence. A comprehensive review of the research shows that academic performance remains unaffected by variations in time allocated to physical education. In fact, in studies that did show physical activity had an effect, increasing instructional time for physical education resulted in *improvements* in academic performance.



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## The Evidence: P. E. Does Not Hurt—and May Help

In study after study, researchers have concluded that devoting more instructional time to physical education or another in-school physical activity program does not harm academics. Five prominent studies show that students' achievement levels remained unchanged when schools increased or reduced instructional time for physical education.

- Researchers in Australia studied 350 5th graders in seven schools throughout the country. They increased instructional time for physical education for some students by 210 minutes per week. After 14 weeks, there were no significant differences in math or reading skills between students who received additional physical education instruction and those who completed the standard three 30-minute periods of physical education per week (Dwyer, Coonan, Leitch, Hetzel, & Baghurst, 1983).
- A study in California investigated the effect on academic achievement of an intensive two-year program in seven schools that more than doubled the amount of time elementary students spent in physical education. Neither overall academic achievement nor achievement in language arts and reading were adversely affected (Sallis et al., 1999).
- A study of 214 6th graders in Michigan found that students enrolled in physical education had grades and standardized test scores similar to those of students who were not taking physical education, despite receiving nearly an hour less of daily instruction in core academic subjects (Coe, Pivarnik, Womack, Reeves, & Malina, 2006).
- A study involving 287 4th and 5th graders in British Columbia evaluated the effects of daily classroom physical activity sessions on academic performance. Ten elementary schools participated. Although students who attended schools implementing this program spent approximately 50 more minutes per week in physical activity, their standardized test scores in mathematics, reading, and language arts were equivalent to those of students in control schools (Ahamed et al., 2007).
- A study involving more than 500 Virginia elementary schools examined the effect of *decreasing* time for physical education, music, and art on academic performance. Reducing or eliminating the time students spent in these content areas did not increase academic achievement (Wilkins et al., 2003).

In addition, three major studies indicate that when students participate in physical education, achievement is positively affected for some groups.

- A Canadian study examined the effects on 546 elementary students' academic performance of one additional hour per day of physical education. Students in grades 2 through 6 who received additional physical education earned better grades in French, mathematics, English, and science than did students who received the standard one period per week (Shephard, 1996).
- Studying 311 4th grade students in two schools, Tremarcke, Robinson, and Graham (2007) found that students who received 56 or more hours of physical education per school year scored significantly higher on Massachusetts' standardized tests in English and language arts than did comparable students who received 28 hours of physical education per year. There were no significant differences on mathematics scores.
- A longitudinal study by the Centers for Disease Control and Prevention followed two national samples involving 5,316 students from kindergarten to 5th grade. Girls who participated in physical education for 70 or more minutes per week had significantly higher achievement scores in mathematics and reading than did girls who were enrolled

in physical education for 35 or fewer minutes per week. Among boys, greater exposure to physical education was neither positively nor negatively associated with academic achievement (Carlson et al., 2008).

The evidence is clear. Decreasing time for physical education does not significantly improve academic performance. Consequently, in an education climate that demands evidence-based instructional practices, the policy of reducing or eliminating school-based physical activity programs cannot be justified.

## **The Link Between Physical Fitness and Academic Performance**

The case for sacrificing physical education is further eroded by studies reporting a significant positive relationship between physical fitness and academic performance. In a nutshell, physically active, fit youth are more likely to have better grades and test scores than their inactive counterparts.

National health surveys involving large representative samples of children and teens from the United States, Australia, Iceland, Hong Kong, and the United Kingdom have reported statistically significant positive correlations between physical activity and academic performance (Trost, 2007). One study analyzed data from nearly 12,000 U.S. high school students. Students who reported participating in school-based physical activities or playing sports with their parents were 20 percent more likely than their sedentary peers to earn an *A* in math or English (Nelson & Gordon-Larsen, 2006).

An analysis of fitness testing results from more than 800,000 students in California revealed a significant positive correlation between physical fitness achievement and performance on state achievement tests in reading and mathematics (Grissom, 2005). And in a study conducted in Illinois, children who performed well on two measures of physical fitness tended to score higher on state reading and math exams than low physical performers, regardless of gender or socioeconomic status (Castelli, Hillman, Buck, & Erwin, 2007).

Although the relationship between physical activity and academic performance requires more research, available evidence suggests that the academic mission of schools may be better served by providing *more* opportunities for physical activity. In fact, controlled studies strongly suggest that engaging in physical activity throughout the school day makes students more focused and ready to learn.

Research has shown that aerobic exercise can improve memory and executive functioning in school-age youth, especially those who are overweight (Buck, Hillman, & Castelli, 2008; Davis et al., 2007). Drawing on a meta-analysis of more than 40 studies that looked at how engaging in regular physical training affects cognition, Sibley and Etnier (2003) concluded that regular physical activity significantly improves multiple categories of cognitive function in children and adolescents. Researchers found improvements in perceptual skills, IQ, scores on verbal and mathematics tests, concentration, memory, achievement (as measured by a combination of standardized test scores and grades), and academic readiness.

Giving students breaks for physical activity throughout the school day can significantly increase on-task behavior. A study conducted in North Carolina evaluated the effects of a classroom-based program that, for 12 weeks, gave students daily 10-minute breaks for organized physical activity. Researchers observed students in grades K through 5 for 30 minutes before and after each break. On average, the activity breaks increased on-task behavior by 8 percent. Among students who tended to be least focused in class, the breaks improved on-task behavior by 20 percent (Mahar et al., 2006).

Researchers don't understand well the physiological mechanisms responsible for enhancements

in cognition related to physical activity. However, emerging evidence from neuroscience suggests that regular physical activity promotes the growth of new brain cells, stimulates formation of blood vessels in the brain, and enhances synaptic activity or communication among brain cells (Hillman, Erickson, & Kramer, 2008).

## What We Can Safely Conclude

The research on the relationship between physical education and academic performance does have limitations. For one, the majority of studies have been conducted at the elementary school level; we need additional studies in middle and high schools. In addition, most studies use the *amount* of time spent in physical education as the key independent variable, without considering the *quality* of instruction. Studies of the effects of in-school physical activity on cognitive functioning also often lack what researchers call ecological validity (transferability of findings). For example, research findings may not transfer to school physical education settings if a study was conducted in a lab or if the type, amount, or intensity of physical activity in the study differed greatly from a typical session in a school gymnasium.

Perhaps most important, we know too little about the effect of in-school physical education on academic performance among students at the highest risk for obesity, including low-income children and those from black, Latino, American Indian, and Pacific Islander backgrounds.

Notwithstanding these limitations, we believe the evidence is sufficiently robust to enable us to draw the following conclusions:

- Decreasing (or eliminating) the time allotted for physical education in favor of traditional academic subjects does not lead to improved academic performance.
- Increasing the number of minutes students spend per week in physical education will not impede their academic achievement.
- Increasing the amount of time students spend in physical education may make small positive contributions to academic achievement, particularly for girls.
- Regular physical activity and physical fitness are associated with higher levels of academic performance.
- Physical activity is beneficial to general cognitive functioning.

## Implications for Policymakers

Keeping in mind that overweight and obesity are compromising the health of one-third of U.S. students, we see three clear implications of these conclusions.

***Conclusion 1: Policymakers must stop trying to justify cuts to physical education on the grounds that such cuts will strengthen school achievement or, ultimately, the economy.***

To be sure, a strong academic education contributes to the future economic health of our society. However, the nation's economic and public health are linked in a delicate balance. It is indefensible to support an education system based primarily on promoting economic productivity in people who will likely be too unhealthy to enjoy whatever benefits come their way.

***Conclusion 2: Policymakers, school administrators, and teachers should stop arguing over whether physical education is essential.***

Physical education is now crucial for promoting and increasing physical activity for children and youth. Considering the amount of time students spend in school and the generally accepted

mandate of schools to model wholesome life choices, the negative effect of keeping students sedentary all day seems obvious. Although school physical education programs cannot single-handedly reverse the trend of weight gain in youth, they can create conditions that help students learn the importance of leading physically active lives—and encourage them to lead such lives.

**Conclusion 3: School administrators must aggressively make room for physical education.**

Administrators may feel hamstrung because of the current climate, but they can promote healthier schools by recognizing the barriers to out-of-school physical activity that exist for many students, working with physical education staff to maximize opportunities for physical activity for all students, and monitoring what goes on in physical education classes.

Those who help shape the education of children can no longer ignore the evidence about physical activity and academics, as well as the serious negative health consequences of further reducing physical education. Physical activity is crucial to shaping future generations of healthy people. It has a legitimate claim to part of the school day.

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**Stewart G. Trost** is Associate Professor in the Department of Nutrition and Exercise Sciences at Oregon State University in Corvallis; [stewart.trost@oregonstate.edu](mailto:stewart.trost@oregonstate.edu). **Hans van der Mars** is Professor in the College of Teacher Education and Leadership at Arizona State University in Mesa; [hans.vandermars@asu.edu](mailto:hans.vandermars@asu.edu).

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