



Theoretical Background

Teachers are well aware of the importance of student attention on learning comprehension, and use many strategies for maintaining student focus in their classrooms. Those strategies include:

- manipulation of the classroom environment,
- behavior management,
- changes in the types of academic tasks over the school day,
- using teaching models that require more active student participation, and
- external strategies that involve school administrators and parents (e.g., reports sent to the home).

These strategies have been shown to be effective in their own way in maintaining and increasing levels of student attention,¹ and any one or more of them can be used by teachers with good results.

Recently, researchers and teachers have become aware of the potential for new and alternative ways to increase student attention that have the ability to make a direct impact on learning. These strategies are more than diversions that can be used to give students a “pause that refreshes” in the midst of the school day. Rather, these strategies provide students with simultaneous cognitive and whole-body physical engagement to promote learning within the activity and improve readiness for subsequent academic tasks. These alternative strategies are based on the growing research evidence of the link between physical activity and learning.²

The TAKE 10!® (www.take10.net) program has been based in part on the theoretical research in brain-based learning, which in part, suggests that whole-body, and cross-lateral movements can stimulate the prefrontal cortex which is used in general learning and specifically problem solving in humans.² Cross-lateral movements are those that involve one or more limbs being moved repetitively across the body’s vertical mid-line. In theory, this repetition opens up neural pathways that facilitate both the readiness to learn (attention) and the ability of the brain to develop (that is, “learn”).^{2,3}

The increased awareness and use of these alternative learning-enhancement strategies has come from other quarters besides the brain-based research field. Three key factors in the everyday practice of K-5 schooling in the United States have contributed to some of this interest:

1. The first factor is the adoption of overt policies at the state and national levels that call for improvements in standardized test scores, achieved in part through more engaged time in core academic subjects.
2. Those policies lead to a second factor, a reduction in the number of minutes allocated for non-core subjects, such as physical education.^{4,5}
3. Those inevitably combine to create a third factor: with more time spent in the classroom, and little or no time for physical activity in the school day, students struggle to pay attention over long periods of academic engagement.

Perhaps, then, the increased time allocated for academic subjects is being negated by reduced rates of student attention needed to bring about improved test scores. In fact, more might not be better.

In addition to brain-based learning theory, the following theories were considered in creating both the content and format of the TAKE 10! program.

*Social learning / social cognitive theory.*⁶⁻⁸ Social learning theory,⁷ later renamed social cognitive theory,⁸ proposes that behavior change is affected by environmental influences, personal factors, and attributes of the behavior itself.⁷ This learning occurs within a social context, including observational learning, imitation, and modeling. It supports two key ideas central to TAKE 10!:

- First, that students may want to emulate behaviors demonstrated by teachers and peers about the importance of physical activity, the different contexts in which learning can take place (i.e., kinesthetically), and the fact that physical activity can be both fun and beneficial to health and academic achievement.
- Second, a central tenet of social cognitive theory is the concept of self-efficacy. An individual must believe in his or her capability to perform the behavior, should perceive an incentive to do so, and must value the outcomes or consequences that he or she believes will occur as a result of performing a specific behavior or action. Self-efficacy is believed to be the single most important characteristic that determines a person's behavior change.⁸ With long-term sedentary behavior the norm in many children's lives, lack of motor skill and brain development are key barriers to learning. A critical contribution of TAKE 10! is its impact on a student's expectations or perceptions of being able to perform physical activity behavior successfully and/or comprehend a learning concept as a result of structured movement that stimulates brain function and attention/focus/concentration.

Surplus energy theory and novelty theory.^{9,10} In addition to the aforementioned work by Jensen,² these two theories support the idea that physical activity improves children's attentiveness and decreases restlessness. The surplus energy theory, first recognized in the late 1800s by Spencer and Schiller, cites activity as a mechanism for children or adults to release excess energy that has built up over time, while they have been sitting or inactive for long periods. The novelty theory claims that on-task attention can be increased by providing opportunities for diversion from boredom or repetition during the learning experience. Once the children complete a TAKE 10! activity and return to a learning activity, students perceive school work as new and novel again.

References

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About TAKE 10!®

TAKE 10! (www.take10.net) is a classroom-based physical activity and health promotion program for elementary schools that was developed by the ILSI Research Foundation. This *tool* (it is not a curriculum) is

designed to add at least 10 minutes of moderate-to-vigorous physical activity to the school day while simultaneously reinforcing academic learning objectives. To support K-5 grade-specific learning objectives, TAKE 10! lessons integrate physical activity with required concepts and skills in language arts, math, social studies, science, nutrition, health, and character education. Designed, implemented, and evaluated with approximately \$1.5 million in grant funds over 10 years, TAKE 10! has been disseminated to more than 55,000 classrooms in 47 states in the United States to date. In addition to the many projects in the United States, TAKE 10! studies in Brazil, China, and the United Kingdom are currently under way.

About the ILSI Research Foundation

The ILSI Research Foundation was formed in 1984 to create a vehicle for the International Life Sciences Institute (ILSI) to support research. The Research Foundation helps ensure scientific credibility of all ILSI-sponsored activities by undertaking the responsibility to address critical issues affecting public health. It meets this obligation by convening expert panels, seminars, and workshops, through resourceful publications, through both basic and applied research awards, and through community intervention programs. This work is underpinned by broad-based fundraising in order to adequately guarantee a diversity of stakeholders in ILSI's mission and programs. The foundation's Physical Activity and Nutrition (PAN) program coordinates its health promotion and obesity-related programming.

About PAN

Established in Atlanta in 1996 to promote healthful nutrition and physical activity behaviors in families, the PAN program has emerged as a leader in research and education concerning prevention and management of childhood obesity. PAN program staff members are most active in the area of technology transfer, moving science from the laboratory to practical application in communities to benefit the public. Working with partners around the globe, PAN investigates mechanisms to address energy balance, good nutrition, and physical activity within the various systems that serve children and families—schools, health care, and communities.

About ILSI

The International Life Sciences Institute (ILSI) was founded in 1978 as a nonprofit research foundation dedicated to advancing scientific knowledge and understanding to improve public health. ILSI establishes partnerships among scientists from industry, academia, government, and public interest groups to advance the understanding of scientific issues relating to nutrition, food safety, toxicology, risk assessment, and the environment. ILSI receives financial support from industry, government, and foundations.

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