The Science Behind Walkabouts:
Related Research at a Glance

Julian A. Reed, Ed.D., MPH

ActivEd and Walkabouts were inspired by years of published research about both education and health — and the correlation between the two. In fact, ActivEd founder Dr. Julian Reed is among the nation's leading researchers exploring the relationship between issues like obesity and academic achievement. Dr. Reed's findings, and his work to help equip and empower teachers across the country, continue to inform all facets of the Walkabouts platform.

The Impact of Movement on Learning

Quite simply, learning is physical. When we move, we learn and we learn as we move. Moving in the classroom promotes cognition, academic performance, academic achievement and reductions in behavior management episodes; simultaneously, reducing the prevalence of childhood obesity by providing regular physical activity.[1-9]

Participating in regular physical activity can provide an array of health benefits ranging from: maintaining a healthy weight, preventing the onset of obesity, cardiovascular disease, Type 2 diabetes and reducing the risks of developing certain cancers to developing muscles and strong bones. Yet, kids are moving less and unfortunately learning less evident by the current downtrend retention and high school graduation rates.

What has and continues to be frequently overlooked is the positive impact regular physical activity has on the central and peripheral nervous systems, and in particular, the developing brain. Numerous studies have

examined the impact of movement on brain plasticity, resulting in the identification of a variety of therapeutic enhancements.[5-9]

Furthermore, regular physical activity has been found to promote structural changes in the hippocampus region of the brain. The hippocampus is an area important for memory.[6-9] Regular physical activity has also been found to increase neurons, dendrites and synapses which are essential structural elements located throughout the Central and Peripheral Nervous Systems.[6-9]

Current research on the brain and brain plasticity documents that physical activity positively affects the brain and brain development. Over two-decades ago, Gabbard and Barton[10] found a positive correlation between physical activity and school performance; yet, the vast majority of school children attending elementary school remains sedentary throughout the school day.

Hillman and colleagues[13] examined EEG brain activity in children who were considered to have a high level and low level of fitness while performing a choice-reaction test. Children who were considered to possess a high level of fitness in the study performed this task more rapidly and had larger P3 amplitudes that are consistent with enhanced executive functioning.

The executive function hypothesis originated in the field of gerontology is based on the idea that the largest improvements in cognition-- the ability to plan, initiate and carry-out activity sequences that comprise goal directed behavior-- are due to exercise and physical activity.[5, 11, 17]

Impact on Academic Performance, Academic Achievement and Cognition

A review paper by Sibley and Etnier[20] found that exercise training is significantly linked to improved cognition in youth. Being an overweight child has also been reported to be associated with poor IQ test performance.[3,18]

A study by Judge and Jahns[15] examining the associations between overweight children and academic performance from data collected in the Early Childhood Longitudinal Study revealed that overweight third grade

children had significantly lower math and reading tests scores in comparison to those of non-overweight children in the same grade.

Collaborating with Classroom Teachers to Increase Daily Physical Activity discovered that integrating movement into the classroom can invigorate students as well as provide positive effects on student learning.[19] Additionally, Blakemore[2] reported that the brain is activated during physical activity by increasing blood flow to essential areas that stimulate learning. Strong associations between the cerebellum and memory, spatial perception, language attention, emotion, nonverbal cues and the decision making ability of students have also been found.[2, 4]

An established relationship between physical activity and the cognitive abilities of the cerebellum has also been identified. Research suggests that increased blood flow as a result of movement enhances the cerebellum by promoting specific cognitive functions.[2-4]

Walkabouts respond to the US Department of Education's call for accessible technology that can help bridge widening gaps in achievement, health and quality of life. They also provide practical steps toward addressing childhood obesity, which the Centers for Disease Control and Prevention and other leading organizations have characterized as the most threatening preventable health epidemic of our time.

Researchers at the RAND Institute identified that overweight kindergartners had significantly lower math and reading test scores in comparison to those of children who were not overweight.[8] Movement is clearly essential to learning.

Jenson[14] argues that learning time is wasted when students sit too much. Jensen[14] posits that:

- Physical activity improves spatial learning. While the brain encounters a space, it makes a map of that space based not only on the physical surroundings but also on the basis of the body's association with the particular space.

- Physical activity enables the brain to develop new maps, even if the movement space is not new. This process serves

to create additional unique learning opportunities through space.

- Physical activity also provides the brain time to digest new information because our brains are designed to only learn bits and pieces of information at a time. The human brain was not designed for children to continuously encounter new information all day without time to process it. Too much information sent to the hippocampus region of the brain, prevents the integration of information and newly learned content.

Additional benefits linked to physical activity and learning were recently highlighted in a published review paper. Taras[21] revealed that physical activity improved concentration, along with reading and math performance, with the strongest relationship between activity and concentration. Physical activity also stimulates the release of epinephrine and norepinephrine (adrenalin) enabling children to become alert and ready to learn.[12, 14]

Dr. Donnelly and colleagues[23] conducted a three-year study in Kansas examined the impact of 10-minute physically active academic lessons on a variety of academic indicators in elementary school students. Significant improvements on these academic indicators were observed in math, reading, and spelling scores among students in the intervention schools, compared to the controls.[23]

ActivEd's founder, Dr. Julian Reed examined the impact of integrating Walkabout lessons into core curricula approximately 30 minutes a day, 3 days a week among 3rd graders on cognition and academic achievement. Children in the experimental group averaged close to 1,200 pedometer steps per integration day, averaging 3,600 steps per week. Children in the experimental group also performed significantly better on the cognitive measures and the state mandated academic achievement tests. [23]

The Demands of Differentiation of Learning Preferences

Kinesthetic Intelligence or the Kinesthetic Learning Style suggests that individuals who prefer this learning style create or solve problems by

moving their bodies. Children with strong Kinesthetic Intelligence often prefer to learn by doing.

However, the Kinesthetic Learning Style is often the most neglected in the classroom.[24-25] Children who possess this learning preference need to move in order to appropriately interpret their sensory stimuli. Yet, most schools throughout the US continue to require children to be seated throughout the school day.[24]

This narrow and dated model of teaching is a strong contributor to the current obesity epidemic because children spend the majority of their weekdays in school. A teacher's goal is to make the learning process as efficient as possible.[26] To do so educators must recognize individual learning styles.

Learning styles are the ways that individuals process new information.[27] Hence identifying individual learning styles has monumental implications for designing the learning environment.[26, 28]

Walkabouts, focuses on providing highly engaging supplementary lessons for the PreK-5 learner that are fully aligned with the State Standards, using physical movements to enhance the classroom learning experience.

With just a few clicks these 7-10 minute web deployed lessons can be used in a variety of ways and are designed to enable teachers to best meet the learning preferences of their students.

In disciplines, such as reading and mathematics, increased levels of achievement have been linked with matching instructional strategies to individual learning styles.[29-30] The key to effective teaching is to understand the range of student learning styles and to be able to design instruction and materials that respond to an individual's learning needs.[31] Despite this new emphasis, the Kinesthetic learner continues to be overlooked.

Key Classroom Challenges and Behavior Management

Classroom behavior management skills are essential for effective teaching. Teachers are charged to develop and maintain a positive,

productive classroom environment that promotes learning while reducing time spent managing.

How well a teacher manages student behavior is critical to the success of each teacher and each student. The behaviors exhibited in a classroom reflect a teacher's ability to meet the learning needs of their students. Behavior management and discipline continue to be one of the main reasons that administrators do not rehire teachers. It is the main source of career-related stress as reported by teachers, and the number one reason that former teachers report for having left the profession.[32]

Movement in the classroom has been demonstrated to decrease behavior management. Investigators in Georgia studied the impact of an activity break on classroom behavior and found that students exhibited significantly more on-task classroom behavior and significantly less fidgeting on days with a scheduled activity break than on non-activity days.[33]

A 12-week research project conducted in eastern North Carolina evaluated the effects of providing elementary students with a daily 10-minute activity break. Among the students in kindergarten through 4th grade, a daily activity break increased on-task behavior significantly, by an average of 8%. Among the least on-task students, the activity breaks improved on-task behavior by 20%.[34]

The Texas Education Agency examined over 2.4 million students and found higher levels of physical fitness were associated with better academic performance. Higher levels of fitness were also associated with better school attendance and fewer disciplinary incidents, including those associated with drugs, alcohol, violence, and truancy. Counties with high levels of cardiovascular fitness tended to have higher passing rates on the Texas Assessment of Knowledge and Skills (TAKS), a state-administered standardized test.[35]

ADD/ADHD and Movement

According to the Attention Deficit Disorder Association (ADDA)[36] approximately 4% to 6% of the US population suffers from ADHD. It is also thought that close to two-thirds of children who have been diagnosed with ADD or ADHD will continue to have problems with these symptoms into adulthood.

Therefore, it is important that children learn how to treat their ADD and ADHD with non-pharmacologic agents such as movement and avoid unnecessary dependence on medications with their attendant side effects.[24]

A study by Tantillo and colleagues3[7] suggests that exercise as treatment has the potential to modify the behavior of children who suffer from ADHD.

Putnam[38] argues that hypokinesis (inadequate levels of movement) can be linked to hyperkinesis or hyperactivity. Moreover, it is thought that children who suffer from ADD or ADHD are able to participate in regular physical activity that could be integrated into regular classroom routines.

Such integrated learning could affect these two disorders positively.[38] A recent paper examining the impact of physical exercise on a 4-year old boy suffering from ADHD revealed that age-appropriate reinforcers, such as activity, were effective in promoting attentiveness and calmness.[39]

Children are naturally curious and active; they are dependent on parental attention and support that will help them to learn. When children are actively engaged in activities they enjoy or are provided with a reasonable level of attention, interestingly, the behaviors that led to their having been classified as ADD or ADHD often disappear.[40]

Walkabouts are simple-to-use, cost-effective online lessons that help teachers, parents and school systems bring National and State Standards to life in a stimulating, non-standardized way. Once logged in, parents or teachers can select expert-suggested Walkabouts sorted by subject and standards, or create their own.

Within minutes, students will be out of their desks and engaged in an active lesson that integrates fundamental movements like hopping, jumping and running with core academic content (such as Language Arts and Math) demonstrated to reduce behavior management episodes in the classroom.

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