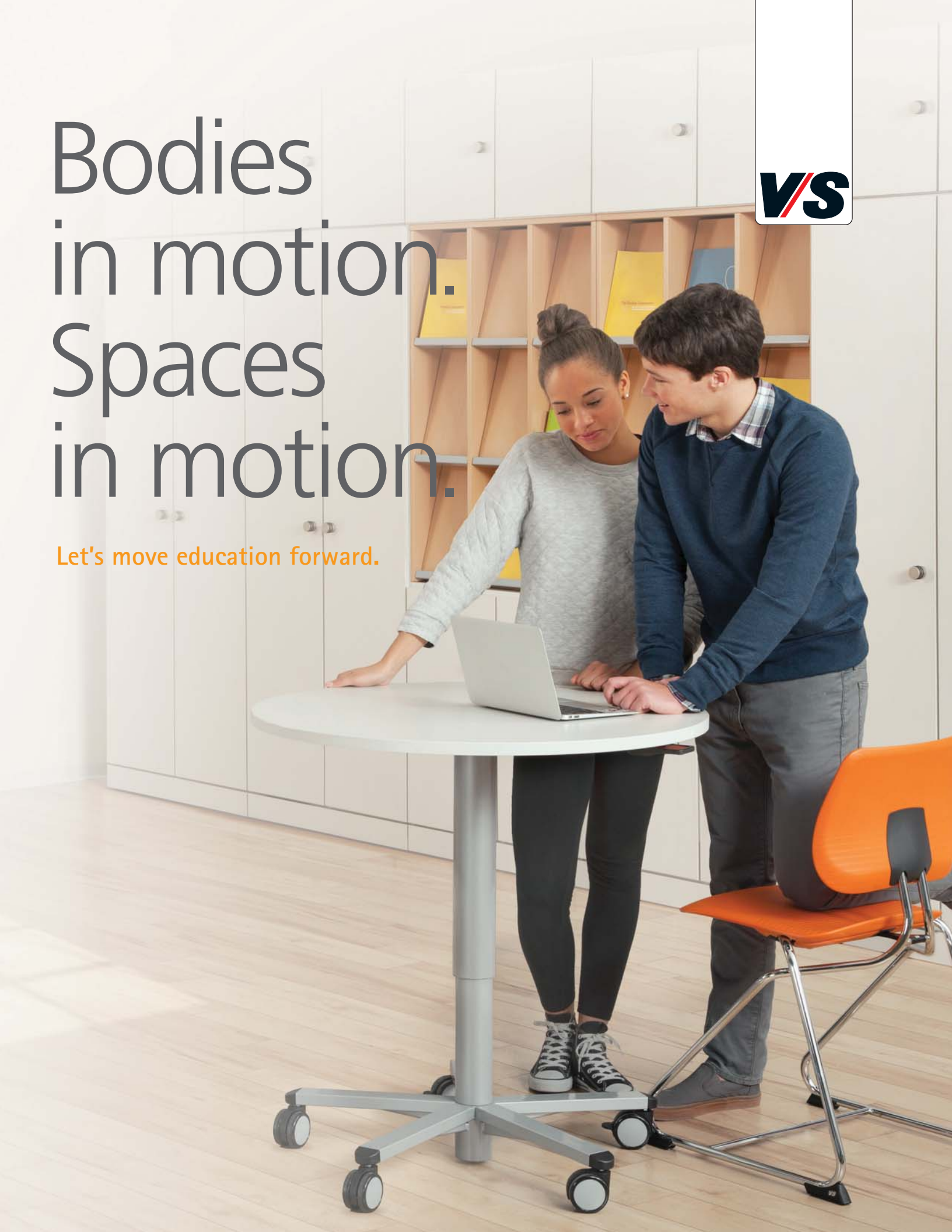
Bodies in motion. Spaces in motion.

Let's move education forward.



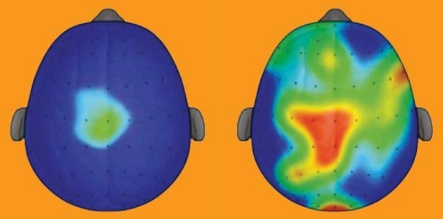
Author Dr. Dieter Breithecker

Dr. Dieter Breithecker is a German Health and Kinetics Scientist. He is the Head of the Federal Institute on the Development of Posture and Exercise in Germany and a member of "Ergonomics for Children & Educational Environment" (ECEE), a technical committee of the International Ergonomics Association. Between 1994 and 1999, he worked as Managing Director of an Ambulatory Rehabilitation Center with emphasis on orthopedic-traumatological syndromes.

Dr. Breithecker is widely published on the subject of Ergonomics for Children and Human Workstations. As an international expert, he has presented throughout Europe, Asia, Indonesia, North America, Australia and Saudi Arabia.

Scientific documentation on the effects of dynamic sitting can be found at haltungbewegung.de/bodies-in-motion or for questions related to ergonomics, email Dr. Breithecker: breithecker@haltungbewegung.de

Physical activity is not only healthy, it's smart. Even small movements, such as fidgeting, improve scores.



No exercise Exercise

A call to action.
The positive effects for physically active students have immediate and long-term benefits.

- 40% higher test scores
- 15% more likely to go to college
- Reduced risk of heart disease, stroke, cancer, diabetes
- 1/10th as likely to be obese
- May live 5 years longer[1]

As educators, planners and designers, we need to push to increase movement during the school day.

The most innovative concept for healthy learning is also the oldest: being in motion. Leonardo da Vinci knew it centuries ago: "All life is movement, movement is life." The science of today confirms it. The complex human system – the interdependency and the balance of body, mind, and soul - is not designed to sit still.

A recent study in the US and Europe found that during the average school day, students are spending up to 80% of their time sitting. Static, sedentary behavior is related to almost all types of chronic diseases including heart insufficiency, diabetes, metabolic syndrome, obesity, gallstones, depression, early aging, neurodegeneration, and even early death.

On the cellular level, changes are even more dramatic. Inactivity decreases nerve cell growth and switching of nerve cells in parts of the brain responsible for memory, motoric learning, and problem solving.

For the first time in history, children are projected to have a shorter life expectancy than their parents.

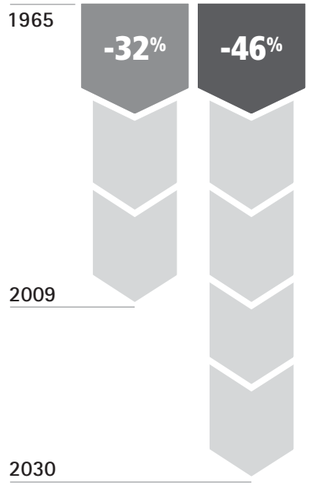
The primary cause is increasing rates of obesity, which has more than doubled in the past 30 years. In addition, approximately 7.5 million US children are experiencing mental and emotional disturbances, primarily depression. And as of 2007, about 9.5% or 5.4 million students ages 4 to 17 were diagnosed with Attention Deficit Hyperactivity Disorder (ADHD). The rates of Autism are also on the rise.

Another cause is the lack of emphasis on movement at schools. With higher test scores being the main objective, many schools have eliminated recess and/or physical education. A recent study showed only 3.8% of US elementary students get daily physical education.

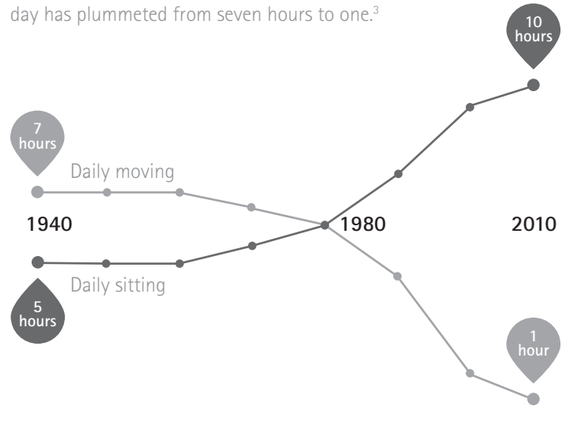
Movement has direct implications on health. Active students display healthier cardiovascular profiles, are leaner, and more likely to remain lean into adulthood, develop higher peak bone masses. Even small movements such as fidgeting can have a significant, positive effect on health. [2,3]

Movement also has a direct effect on happiness. A study published in the *Journal of the National Medical Association* found that "a moderate, regular exercise regimen is as successful as a pharmacological treatment of people suffering from depression."

Physical activity decline
From 1965 to 2009, physical activity in the US declined 32%. And looking ahead to 2030, it's projected that we're on track to continue to drop to 46%.[1]



Sitting vs moving
The trend is painfully clear. The time adolescents spend sitting has doubled, while hours spent moving during the day has plummeted from seven hours to one.[3]



Movement is the way forward.

The current state and health of our kids are compelling reasons to increase movement and improve classroom ergonomics.

The journal *Pediatrics* (2014) published research that ADHD kids who took part in a regular physical activity program showed important enhancement of cognitive performance and brain function. The findings, according to University of Illinois professor Charles Hillman and colleagues, "demonstrate a causal effect of a physical program on executive control, and provide support for physical activity for improving childhood cognition and brain health."

Physical activity is a high-yield investment for all kids, especially those challenged with attention or hyperactive issues. In short, movement is ADHD medication.

Spontaneous movement is just as important as exercising.

Most people associate movement with exercising, yoga, jogging, weight training or sports. Physical and mental balance also needs the subtle movements, of which we are not always aware.

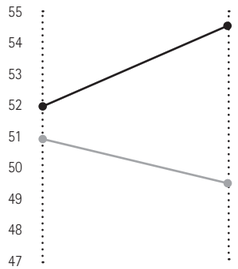
When we stand freely, we're never completely static. We subconsciously move around to maintain well-being and comfort. These complex postural changes range from spontaneously changing your standing leg, moving back and forth on a chair, drumming one's fingers on the table, or hand gestures when talking. The same types of subconscious adjustments occur when we sleep. We toss and turn up to sixty times every night.

Spontaneous muscle contractions keep us balanced and focused. Our furniture should enable that.

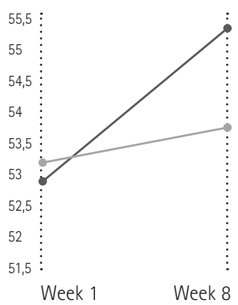
Regular and spontaneous physical activity in comparison to structured sports or workouts are important to balance body, mind and soul. Spontaneous movement impacts energy balance and helps students stay organized, focused and more engaged in learning.

Movement stimulates higher test scores.
An 18-month research study in several German elementary schools showed students with sensomotoric stimulation during the school day had significantly better test results.[4] Even small movements enabled by a responsive chair like the PantoMove or the B1 Chair can play an important role in performance.

Reading test scores



Math test scores



Sensomotoric stimulation
No stimulation

A research study focused on sitting variability on a chair with 3D function found that complexity of movement is a better predictor of physiologic systems than simply the amount or frequency of movement.[5]

Movement is a basic human need, like eating, drinking and sleeping.

To increase movement, improve classroom ergonomics and the design of learning spaces, we have to be ready to break with paradigms. And we have to readdress fundamental questions.

- What is human nature?
- What are basic human needs?
- What do students need for their well-being?
- What potential for healthy sitting and vital learning is yet to be tapped?

To address these questions we collaborated with three outstanding research partners: Federal Institute on the Development of Posture and Exercise in Wiesbaden, University of Applied Sciences in Idstein and the European Union project "TFE" (Task Furniture in Education).

Together, we developed and tested an innovative school furniture line which now allows a **natural sitting and subconscious body movement** during a school day to enhance well-being and learning. Here's how our findings apply to designs for furniture and more effective learning spaces.

Let's design stimulating learning spaces that invite more movement.

Senses balanced. People balanced.

The design of learning and working spaces is interrelated. It should take into account that growing bodies are not meant to sit still.

Well-being, attention, concentration and social exchange are closely connected to how positively stimulating the environment is. Space is even referred to as the "third teacher." In this context, classrooms are now transitioning from pure seated workplaces to areas where students move around.

More health-oriented space designs today emphasize brightness, colors, design, acoustics and climate. Based on the principle of "If the senses are balanced, then people are balanced," our concept of Bodies in Motion aims at the sensory system that needs a boost due to today's sedentary lifestyle.

From early age through adulthood, stimulating the body's deep sensibilities is vital to the developmental process.

Joints, muscles, tendons and the inner ear, known as the vestibular-proprioceptive sensory system or deep sensibility, all need constant stimulation. Just as eyes need light to see, deep sensibility needs human movement to be engaged.

Classic schoolroom concepts with passive sitting and student-centered methods of teaching inadequately challenge this deep sensibility, which then begins to wither. The consequences can be seen in poor body awareness. Recent neuroscientific studies show that lacking stimulation of deep sensibility also has a negative effect on our metabolic processes in the brain. As a result, our mental capacity also suffers if there is a lack of movement.

Go ahead and fidget. It's part of the learning process.

A study of more than 2.4 million Texas students grades 3-12 found students' fitness and BMI levels correlate with academic test performance. As with fitness attainment, fidgeting shows similar results to exercise on its positive impact on academic achievement. A 2008 study found that "students who fidget in class learn more quickly than those who stay still," and that fidgeting may be a by-product of knowledge attainment as students fidget more when a task requires them to store and process information. [6]

Environmental change = behavioral change.

When environments encourage and promote movement during instructional time, students expend more energy. In contrast, traditional seated environments may actually constrain students' natural physicality and restrict movements. By creating spaces that change physical behavior, we're doing a service to our students physically, intellectually and attitudinally.

Promote posture changes with adjustable height, mobile desks and chairs.

Tall chairs with adjustable foot ring are used in connection with a variety of standing table and desk solutions. This promotes posture changes, use of body language, and allows discussions to be held at eye level so that everyone can participate as they prefer.

Become a quick-change artist. Four smart steps.

Learning spaces that enable quick changes in posture and movement lead to more effective teaching and learning.

More is expected from teachers and students today. Modern school programs require more student-centered and self-organized learning to adequately prepare physically and mentally healthy students.

So what needs to be taken into account to create a dynamic, responsive learning space? Consider these four steps:

1) Focus on ergonomic awareness and humane workplace design. (see also V/S Bodies in Motion – Brains in Motion brochure)

2) Support the tasks and activities performed in everyday school life in a variety of locations including classrooms, media rooms, corners, niches in hallways and outside areas.

3) Create rooms for individual needs that arise during daily school life after rhythmic changes of tension and relaxation and/or stress and recovery.

4) Allow for easy transitions from student-centered learning concepts such as group work, self-organized learning, process work, and create space for less formal forms of organization.

We need movable furniture for flexible learning spaces to support varied methods of teaching and learning styles.

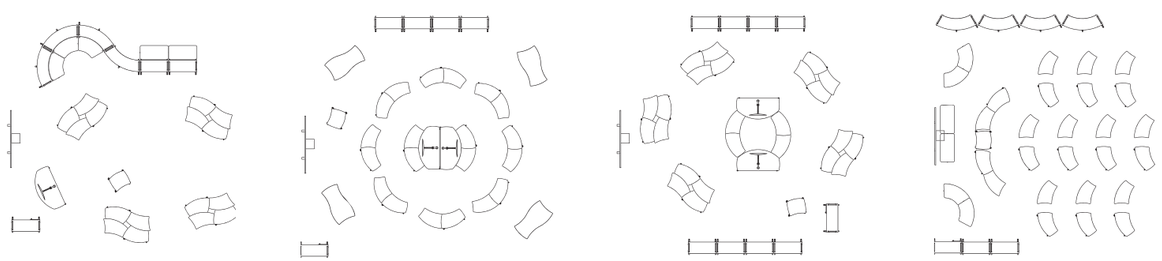
Create agile learning spaces with reconfigurable solutions that allow teachers and students to be more creative in their teaching and learning styles – and more physically and mentally engaged. The mobility and the composition of the furniture we recommend also allows for shifts between different types of teaching methods and styles.

Choose variable furniture components versus uniform. Freedom of choice and a mix of furniture allow for more dynamic uses of space while supporting mental and physical alertness for both teachers and students.

Use multipurpose elements – for example, an adjustable table that can function in a variety of ways: as a standing podium, a desk or a small group workstation.

SHIFT+

Shift+ is a new set of tools for flexible learning environments. Shift+ can be easily reconfigured to fit any educational style and any space, from classrooms to collaborative spaces to media centers. Shift+ seat modules can be configured to create small oases where students can recharge, relax or participate in more intimate discussion groups.



Specify tables to go with the flow. And together.

Easy to move. Easy to adjust.

Tables that are height-adjustable and equipped with rollers offer the maximum flexibility for students and teachers. For frequent changes in the classroom layout, it's also helpful to have either stacking or nesting desks and tables.

We recommend mixing group and individual tables. Ideally, the various table styles even fit together to promote collaboration and creativity. The TriTable collection shown on the opposite page and Shift+ are among the most versatile, flexible systems on the market today.

Adjustable, mobile and fixed-height standing tables are game changers.

There's often a different dynamic at a standing meeting, or simply collaborating while standing. In addition to the healthy benefits of movement, changing the landscape can contribute to productiveness and creativity.

Standing tables and conference tables are important furniture elements that complement all learning spaces and allow for quick transitions from sitting to standing. Activities such as reading, project-based learning, free work, and many kinds of collaboration can be done more effectively when students stand as opposed to sit.

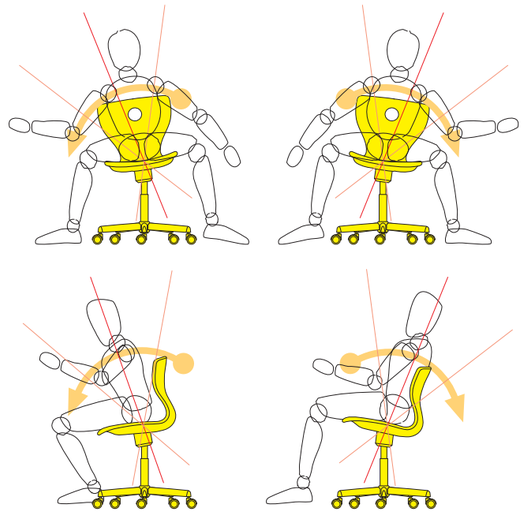
Sync with the natural rhythms of students and smart spaces.

Chairs designed for humans who can't sit still. And for everyone else who should keep moving too.

Apart from the requirement for furniture that adjusts and adapts to growing students and students of different sizes, the design of a humane workspace is based on the understanding that our bodies are not designed to be motionless. Chairs need to allow for natural movement and not hinder it. We like to think of chairs and natural behavior as one system.

Active seating that allows for and adjusts to subconscious body movements.

Because sitting students are in constant physical relationship with their chairs, school chairs need to be able to accommodate a range of natural movements – not inhibit them. This need can be met by an ergonomic roll-swivel chair with the seat surface that offers three dimensional movements. The seat adjusts to all subconscious position changes of the student's body and simultaneously encourages the body to change itself. This active seating has a natural rhythmic effect on the entire postural system.



PANTOMOVE

This ergonomic roll-swivel chair with 3D movement in the seat automatically adjusts to all subconscious position changes and simultaneously encourages the body to change itself. These dynamic seating activities allow the student freedom of movement, which is the foundation of a healthy attitude, healthy blood flow and continuous concentration.

Encourage thinking on your feet.

Standing students burn 15% more calories and have improved concentration.

According to a study from three schools in Texas, when students are given the opportunity to stand during classroom time, they burn more calories and seem to have greater attention span.

The research, conducted by A&M associate professor Mark Benden, introduced "stand-biased" desks to 480 students in three elementary schools in the College Station Independent School District. Each student wore arm sensors to record "step count" and "calorie expenditure" across five consecutive school days.

Findings:
The raised desks (which have stools nearby) significantly increased activity. Students burned 15% more calories than a control group that used traditional sitting desks.

Benden says the desks also improved concentration, according to follow-up interviews with the 25 teachers involved, and that younger kids were more willing to stand than older students.[7]

Here are a few recommendations and notes about the features of our tables.

- Every classroom should have at least one mobile, height-variable standing workplace. Table surface should be about 36" so that four to five students can work together.
- Optimal solution: three to four standing tables on lockable rollers that can be brought together according to group size.
- Adjust the height of the standing tables to the average body height of the group.
- Individual standing tables feature form-adjusted foot rests. Their dimensions are designed so that they can be easily moved through the doors of classrooms.

The right chair for your campus. And hippocampus.

The measurable benefits of active seating:

- Spinal positions regularly shifted
- Intervertebral disks continuously flooded with nutrients
- Complex back muscles stimulated
- Over 100 joints in spine constantly in movement
- Internal organs operate more effectively
- Blood circulation and oxygen absorption optimized
- Neurochemical processes, including those that promote concentration and attention enhanced

THE B1 CHAIR

Opening up the torso and hips while sitting is healthy, natural movement. The B1's double cantilever enables the body to shift forward and backward. And as we like to say, when the body's moving, the mind's grooving. From a design perspective, the B1 offers the best of both worlds, functionality and durability combined with sophisticated lines – making it spot on for higher education.

Agile learning spaces promote creativity.

Creativity in the classroom can start with creative solutions.

Breaking with formal structure keeps students engaged and encourages thinking outside the box.

Alternative seating that adds diversity and interest.

Movable stools in various sizes are a creative addition for dynamic seats and a flexible way to offer alternative seating. We don't see them as a substitute for chairs, but a welcome addition to any learning or communal space. The Hokki stool offers controlled freedom of movement. With its rounded base, the Hokki can rotate in all directions while remaining stable. In four heights for students of all ages, the Hokki is an easy, affordable option that adds diversity and a little wink to any learning space.

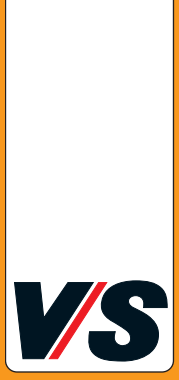
Reconfigure any space on the fly. And students can get in on the act.

Mobile dividing walls enable teachers to change the space depending on the activity, to block noise or visual disturbances, and for individual or group work. They're also light enough for students to lend a hand in transforming the classroom.

Design for flexibility and freedom of movement. And enable students and teachers to be healthier, happier and better performers.

To learn more about ergonomic VS products and agile learning spaces visit vs-network.com

SOURCES:
1 ©Nike, Inc. (2012, 2013) Designed to Move: A Physical Activity Action Agenda™
2 Educational Facility Planner research: Reshaping Education Facilities to Encourage Movement. Vol. 47, Issues 2,3
3 Historic and Projected Physical Activity (PA) Levels (Developed Economies) A. Ng, S. W., and Popkin, B. M. (2012). Time use and physical activity: a shift away from movement across the globe. Obesity Reviews. doi:10.1111/j.1467-789X.2011.00982.x. National Center for Health Statistics (2012). Son, Sung E., M.D. Kirchner, Jeffery T. D.O. (2000). Depression in Children and Adolescents. CDC (2010). Blumberg SJ, Bramlett MD, et. al. (2013) Changes in prevalence of parent-reported autism spectrum disorder in school-aged U.S. children: 2007-2011-2012 National health statistics reports: no. 65. Hyattsville, MD: National Center for Health Statistics. U.S. Department of Health and Human Services, surgeongeneral.gov Overweight and Obesity: Health Consequences (2001) surgeongeneral.gov/library/calls/obesity/fact_consequences.html retrieved July 9, 2012
4 Ministry of Education, Hessen Germany 2012
5 University of applied Science (2011) Idstein
6 Welk, G. J., et al. (2010)
7 FastCompany: Standing Desks Are Coming To Schools, To Cure Obesity And Increase Attention Spans



Art-No. BIMSIM 03-01-2015 Vol. 1

VS AMERICA, INC.

1940 Abbott Street
Charlotte, NC 28203

Phone 704.378.6500
fax 704.378.6005

info@vs-charlotte.com
www.vs-network.com
facebook.com/vsamericainc