„Bodies in Motion“

How classroom design inspires body, mind and soul

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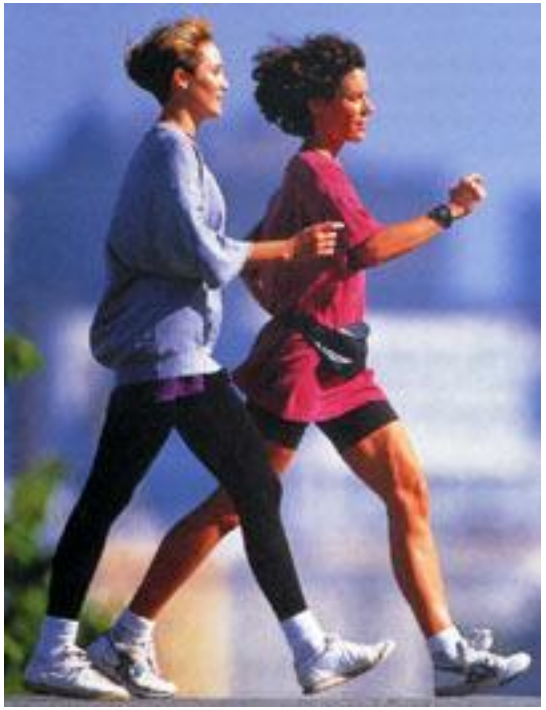
The Problem At Hand

The human body is not designed to sit still

„Watching a child makes it obvious that development of body and mind comes through movement“ (Maria Montessori).

Movement is a basic need
Movement is not like Movement



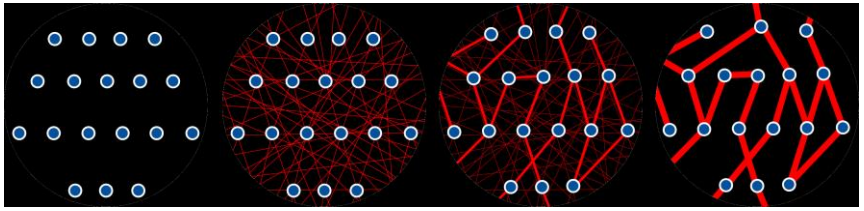
Voluntary (planned) exercise = locomotor activity that is not directly required

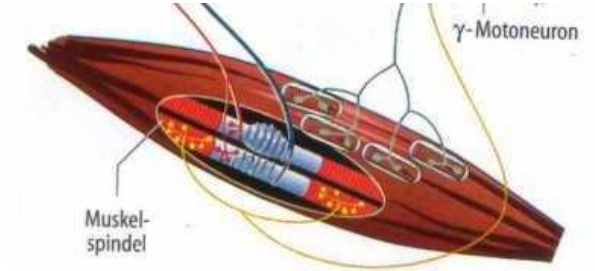
Movement / Motion

Intuitive, spontaneous physical activities such as fidgeting, standing, walking are basing on supply requirements and are part of evolution.
Those basic activities have an high impact on healthy functions (Owen et al. 2010)

Senso-neuro-muscular interplay

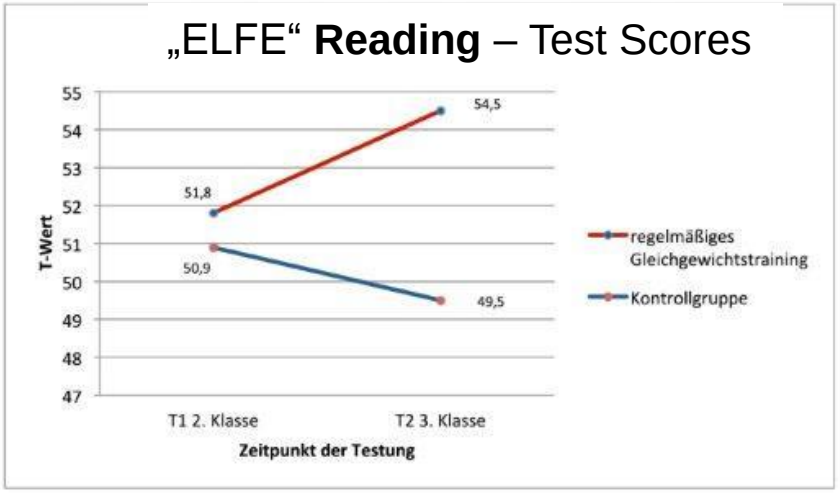
The holistic effect of an autonomously ‘play’ with the sensory (proprioceptive) and muscular system and its interactions



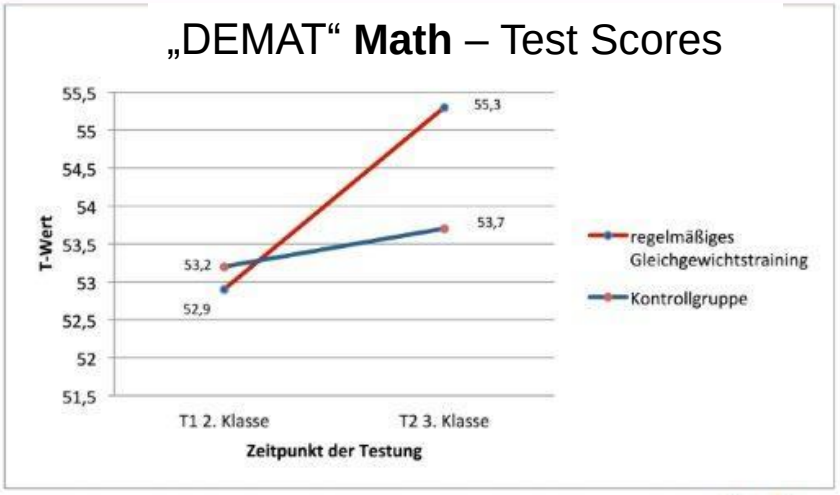


- Beispielhaft einige Evaluationsergebnisse in Diagrammdarstellung -

Signifikant bessere Lesefähigkeit (ELFE) **



Signifikant bessere Leistungen im Mathematiktest (DEMAT) **



Research in several German elementary schools 2010 – 2012 (18 month)
State: Hessen

Intervention Group: 400 students
Control Group: 250 students

Intervention Group: regular sensomotoric stimulation during a school day

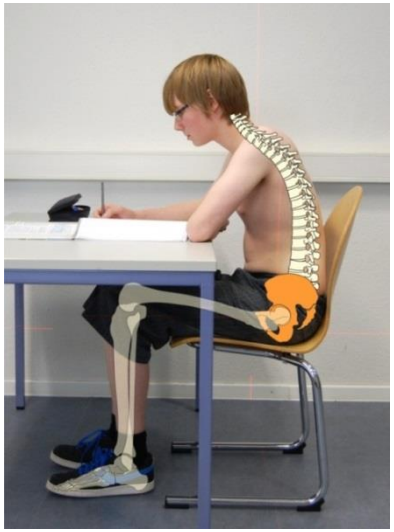
Result: significant better test results – red line – of the Intervention Group in comparison to the Control Group – blue line

(Project „Schnecke“ by the Ministry of Education in the State Hessen/Germany 2014)

SIMPLY MOVE

When the sensory system is out of balance . . .

The risk of a „Sedentary Behaviour“



. . . We stop the contraction of the antigravity (postural) muscles

The **Sendentary Death Syndrome**
. . . risk factor for a number of chronic diseases

- Obesity
- Metabolic Syndrome
- Mental Disorders
- Auto-Immune Diseases
- Cardio-Vascular Pathologies
- Chronic Back Pain
- Cancer

(Daley 2008, Booth 2007, Hamilton 2007)

The prolonged sedentary behaviour during work day /school day has negativ consequences on health, regardless on the benefits gained by participating in physical activity (Healy 2008; Ekblom-Bak 2010)

Goal: Sit less, Move more

Quality

Instructional Technology –Eanes ISD

Quantity

All-cause mortality is associated with sitting time >3 hours/day (survey data of 54 Countries Worldwide) (2016 American Journal of Preventive Medicine)

Why so many students can‘t sit still?

The natural behaviour of the kids is decisive for the design / function of chairs

Children are going to class with biological functions (genetics) that are less prepared to learn in a exclusively sitting and receptive way.
Make peace with fidgeting! ⇒ turns their brains on

„Make Peace with Fidgeting!“

“children who fidget . . . learn more quickly than those who stay still” and that may be an byproduct of knowledge attainment as students fidget more “when a task required them to store and process information rather than just hold it”. (Welk 2010)

. . . but fidgeting certainly burns more calories than sitting still (Levin 2009)

Various recent data confirmed that fidgeting and regular motion have better grades, higher focus, better attendance and are generally better behaved (http://www.nea.org/tools/47003.htm, Breithecker 2004)

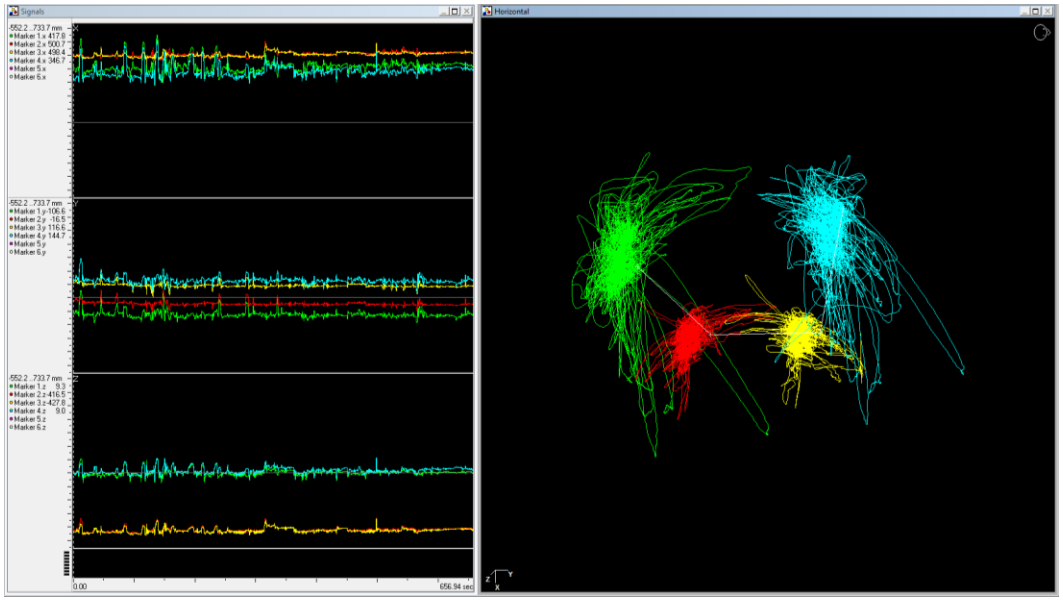
Fidgeting helps children with attention deficit/hyperactivity disorder (ADHD) when working on more complex subjects (Dr. Mark Rapport, University of Central Florida)

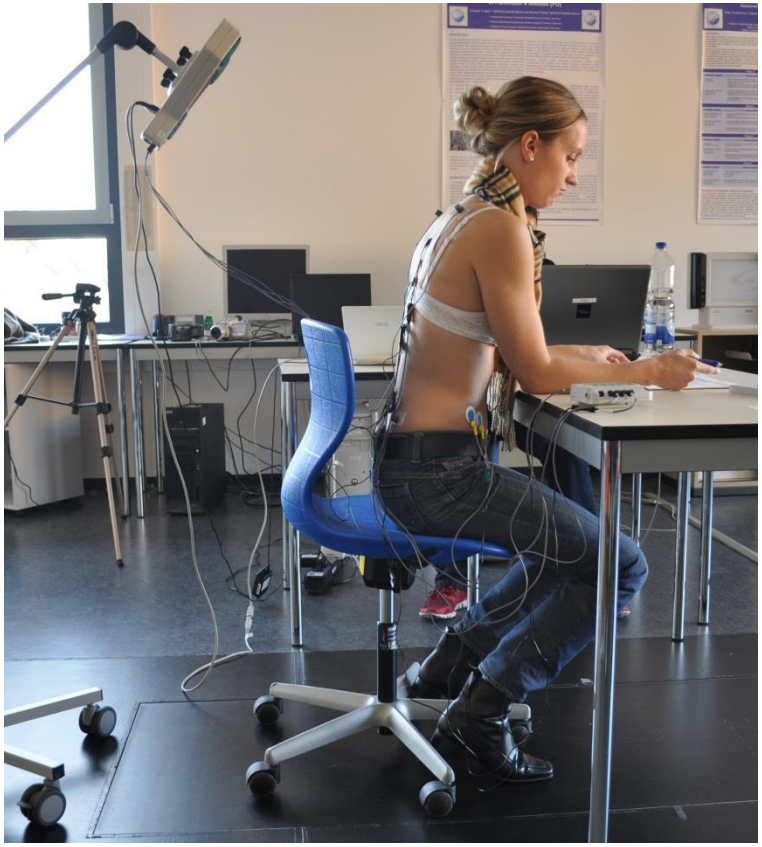
If you want a child to be attentive and stay on task, and also if you want them to encode the information you‘re given them in their memory, you‘ve to give then the chance to move regulary (Ohio State PedaticianBob Murray)

ErgoDynamik

The complexity of postural sway while seated on a chair with a 3D Function

Haas / Breithecker 2010 / 2011 (measured by electromyography and ultrasonic)





The complexity of movement is a better predictor of physiologic systems than simply the amount or frequency of movement

Create Spaces That Inspire Motion

Give your ideas some legs

“Life shows itself in form of movement. Where movement is restricted diseases will spread "

(Dr. Andrew Taylor Still, founder of Osteopathie)

“It is only ideas gained from walking that have any worth.” —Nietzsche

Enriched Physical Environment

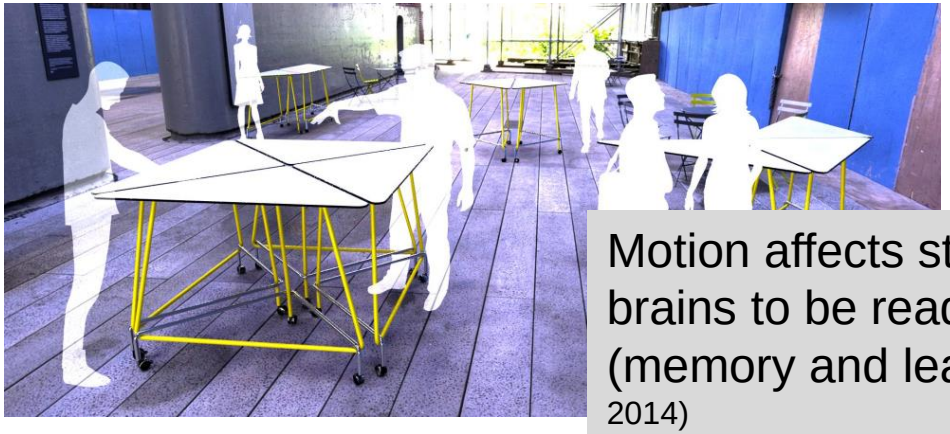
Baseline: Interaction between an organism and its environment – muscular contraction – can lead to important biological effects . . . powerful effects on brain functions and structure (BDNF) *(Ickes 2004; Anderson et al., 2002; Budde et al 2008,)*

A boring and restrictive environment affects the brain negatively, particular the complexity of its synaptic connections

Brains in a physical stimulating environment have an increased cortical thickness, and both neuronal and vascular complexity as well as improved cognitive skills

The Third Teacher

Complex work processes require a supportive equipped environment
No single space can do this alone



Motion affects students‘ biochemical system assisting their brains to be ready to learn. . . . Larger Hypocampus (memory and learning) (Breithecker 2005; Daniel et al 2011; Burzynska et al 2014)

The Copenhagen Consensus Conference 2016: children, youth, and physical activity in schools and during leisure time

(24 researchers from 8 countries and from a variety of academic disciplines gathered in Snekkersten, Denmark)

- Physical activity is beneficial to brain structure, brain function and cognition in children and youth.
- Physical activity before, during and after school promotes scholastic performance in children and youth.
- Time taken away from academic lessons in favour of physical activity has been shown to not come at the cost of scholastic performance in children and youth

Conclusion

- Humans moved from an active, agricultural lifestyle to one being exposed to restriktiv environments, digital supports and automated transport
- A body sitting in a static and passive way isn‘t expending energy . . . moleculary bored, not being called into duty . . . Poor health and early death
- The benefits of any exercising can be blunted if you spend most of the day sitting – the metabolic effects of sitting are overwhelming any benefits that exercise might have
- Recommendations like standing instead of sitting is not a final solution
- Inactivity is killing our brains. The brain needs the body
- By simply changing the work style, from a chair-based work style to a one with any type of brief, yet frequent, muscular contraction throughout the day can enhance metabolic health and burn 500 to 1000 extra calarories a day
- Results are optimistic in showing that modifiable lifestyle factors such as regular physical activity (PA) and reducing sedentariness may be beneficial for brain health (Burzynska et al 2014)

For further information on the concept contact

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