

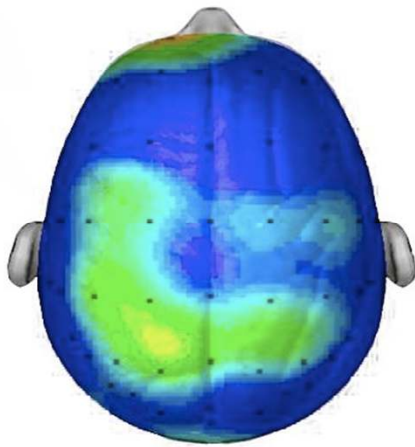
Twist and Shout!

How physical movement can enhance the practice of STEM teaching

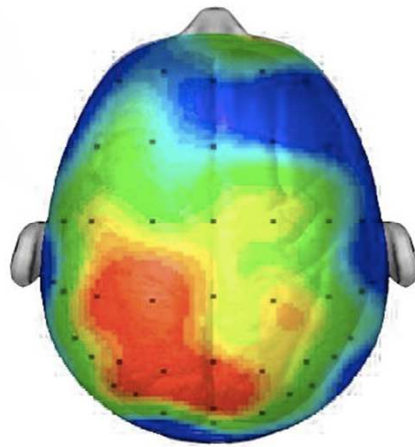


Your Brain on Exercise

Composite of 20 student brains taking the same test



After sitting quietly



After 20 minute walk

Research/Scan compliments of Dr. Chuck Hillman University of Illinois

- Exercise causes the heart to pump more oxygen-rich blood to the brain
- Exercise stimulates the brain plasticity by stimulating growth of new connections between neurons
- Exercise causes an increase in “feel good” neurotransmitters, as well as a decrease in stress hormones



What the Data Says

- Positive correlations between movement in the classroom and:
 - Feelings of self-worth, hope
 - Development of social skills
 - content retention*
- Decreased movement leads to an underdeveloped vestibular system, a key characteristic of those with ADs
- A decrease in number of parks, playground equipment, as well as P.E. in schools may lead to increase in ADs.

*This is true for students of ALL ages, including adults!



Explicit vs. Implicit

Incorporations of Movement into Curriculum

- **Explicit:** Letting students in on the fact that you're incorporating movement into the lesson as you're carrying it out, and why.
- **Implicit:** Using physical movement without pointing it out; just as a natural component of the lesson that happens to make kids move!



Preschool Science Camps



Explicit Use of Activity:

- Morning routine/exercise “experts”
- Fast jumping jacks
- Energy checks

Implicit Use of Activity:

- Changing learning environments often
- Active Transitions: atom walk, photon walk
- Song and dance revolving around content



Elementary Camps

Explicit Activity:

- Morning stretches
- Jumping jack intermissions
- Tag and other games during lunch/snack breaks



Implicit Activity:

- Running the length of cow's small intestine (110 ft.)
- Resting vs. active heart rate
- Lung capacity with ping-pong balls



Middle School Camps



Implicit Incorporation of Movement:

- Forensics: Spread-out crime scene
- NASA: SCUBA Micro-Gravity simulation, walking to rocket-launch and other sites



Explicit Incorporation of Movement:

- Morning sanity stretches
- Sportsology Camp
- Cycling Science Camp
- Tag games + tree climbing



Resources Used

- Blakemore, C. *Movement is essential to learning*, Journal of Physical Science, 74 (9).
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- Craig, D. *Brain-compatible learning: Principles and applications in athletic training*, Journal of Athletic Training, 38 (4).
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- Hannaford, C. (1990). *The brain gym option for hyperactivity, ADD, E.H., Sp.Ed., L.D., and FAS*. Australian Journal of Remedial Education, 26 (1).
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- Price, S., and Rogers, Y. (2004). *Let's get physical: The learning benefits of interacting in digitally augmented physical spaces*, 43 (1-2).
- Spielmann, C., and Pearce, K. *The Effects of Movement Based Learning on Student Achievement in the Elementary School Classroom*.
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