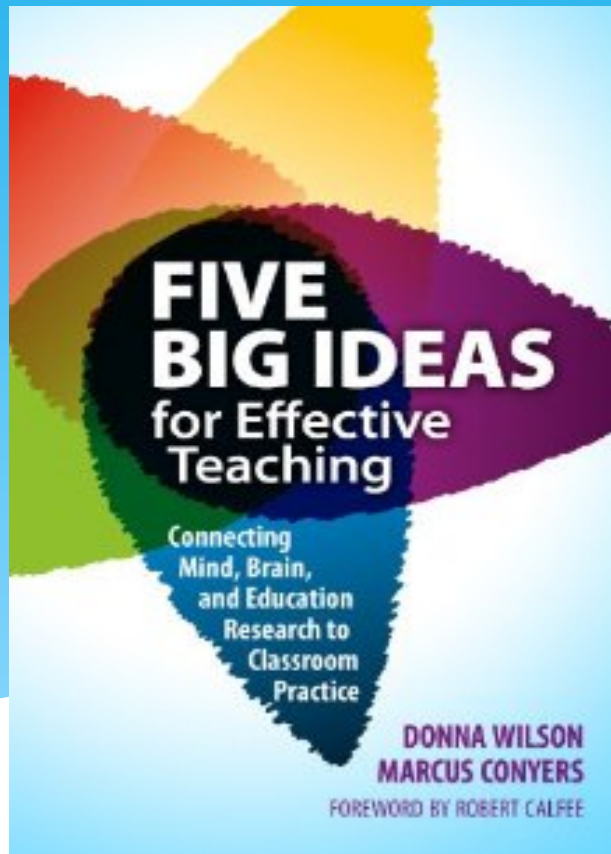


Research-Based Ideas for Improving the Quality of Learning and Teaching Birth Through Grade Three



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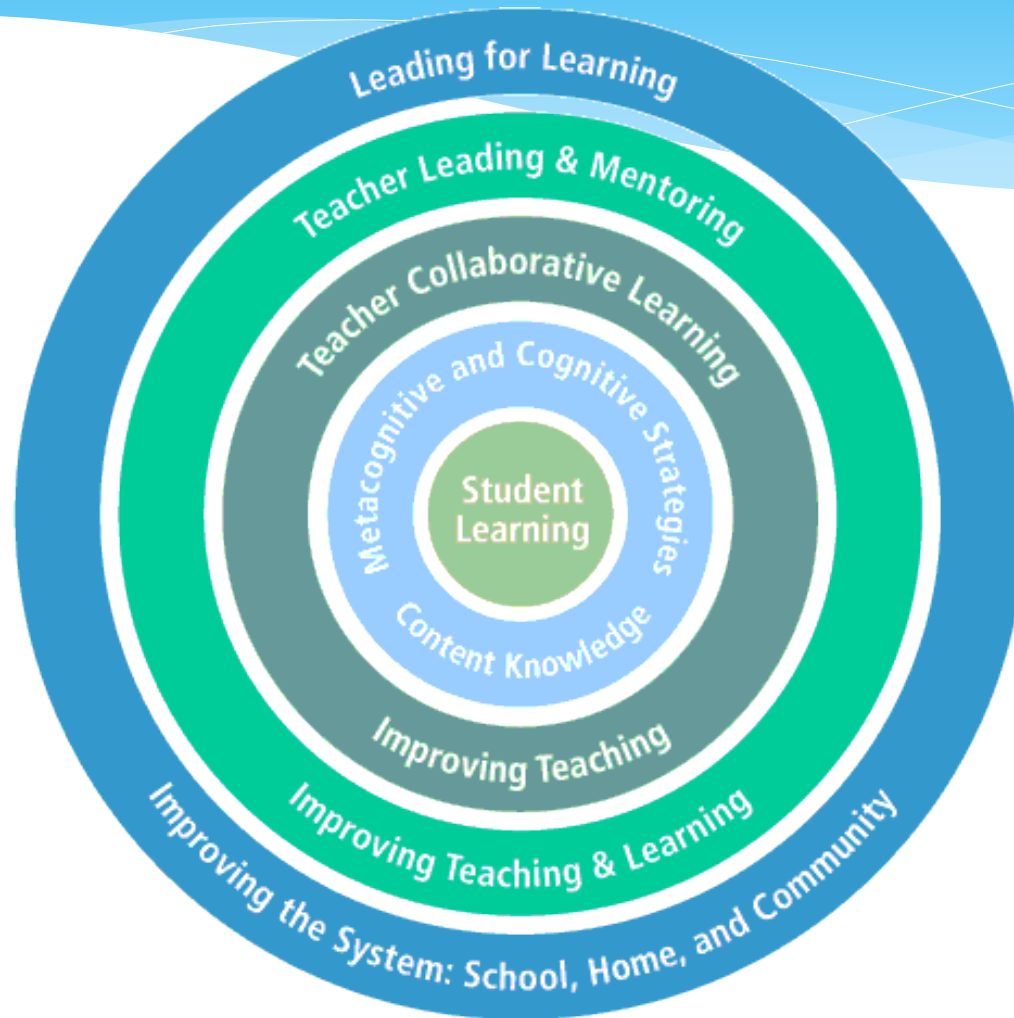
M.S.: Brain-Based Teaching:
Learning and Teaching
Reading and Literacy

Ed.S. Brain-Based Teaching

Ed. D. Minor, Brain-Based Leading

www.brainsmart.org

Connecting Learning Science to Leadership





Questions to think about...

- * What misconceptions about the brain and learning could be adversely affecting practice and policy?
- * How could a scientific foundation for learning and teaching inform policy and practice?
- * How can you align policy with strategies for teaching so students learn at higher cognitive levels?
- * How can research inform policy in support of the development of teachers?



The Challenge:

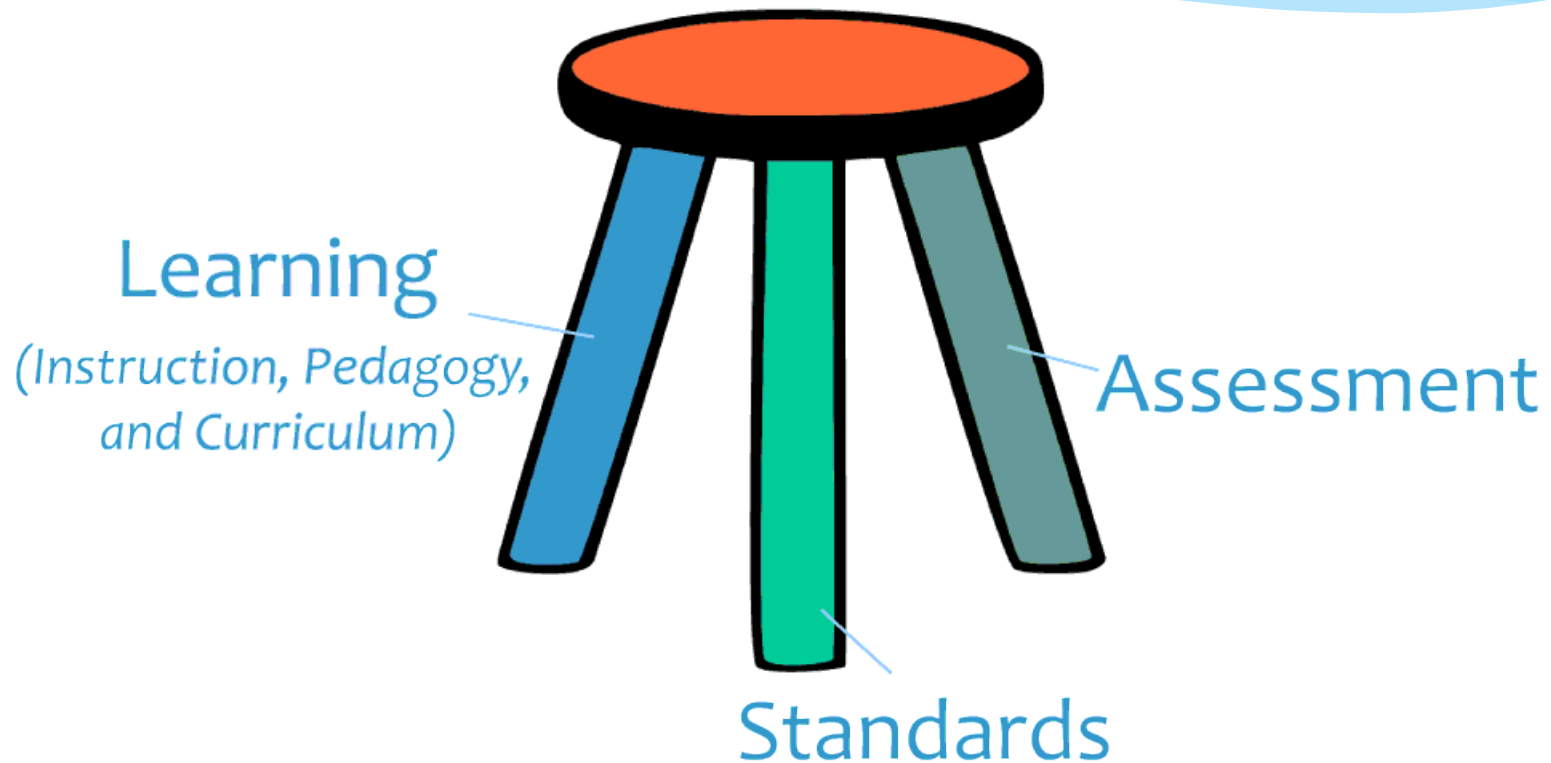
Schools and students are being held to higher standards than ever before. Standards emphasize complex, new knowledge and skills needed in the 21st century. Today's education system must now ensure that virtually all students achieve at higher levels with shrinking resources.

The Hope:

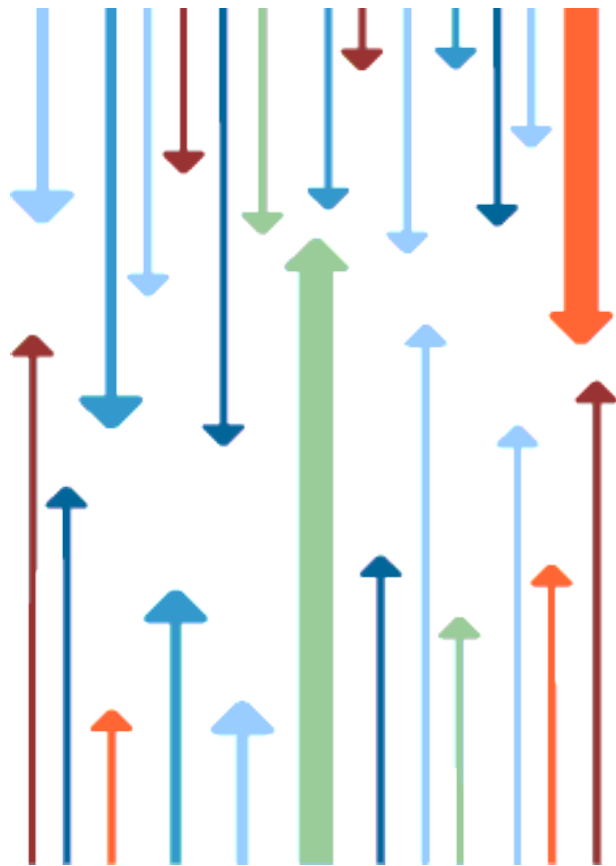
Educators. Specifically, the teachers who teach our children each day. We must support them to learn, both individually and together.

**Systematically inspiring, motivating,
and supporting teachers is our
number one priority.**

Today We Will Be Discussing Learning



The BrainSMART Center and Center for Innovative Education and Prevention



For over two decades ...

- * We have asked “What do teachers and administrators need to do to ensure that students learn at higher cognitive levels?”
- * We have used research and theories from mind, brain, and education as a coherent, conceptual framework for practice.

Pedagogy: Setting Up a Growth Orientation

Formula for More Effective Teaching:

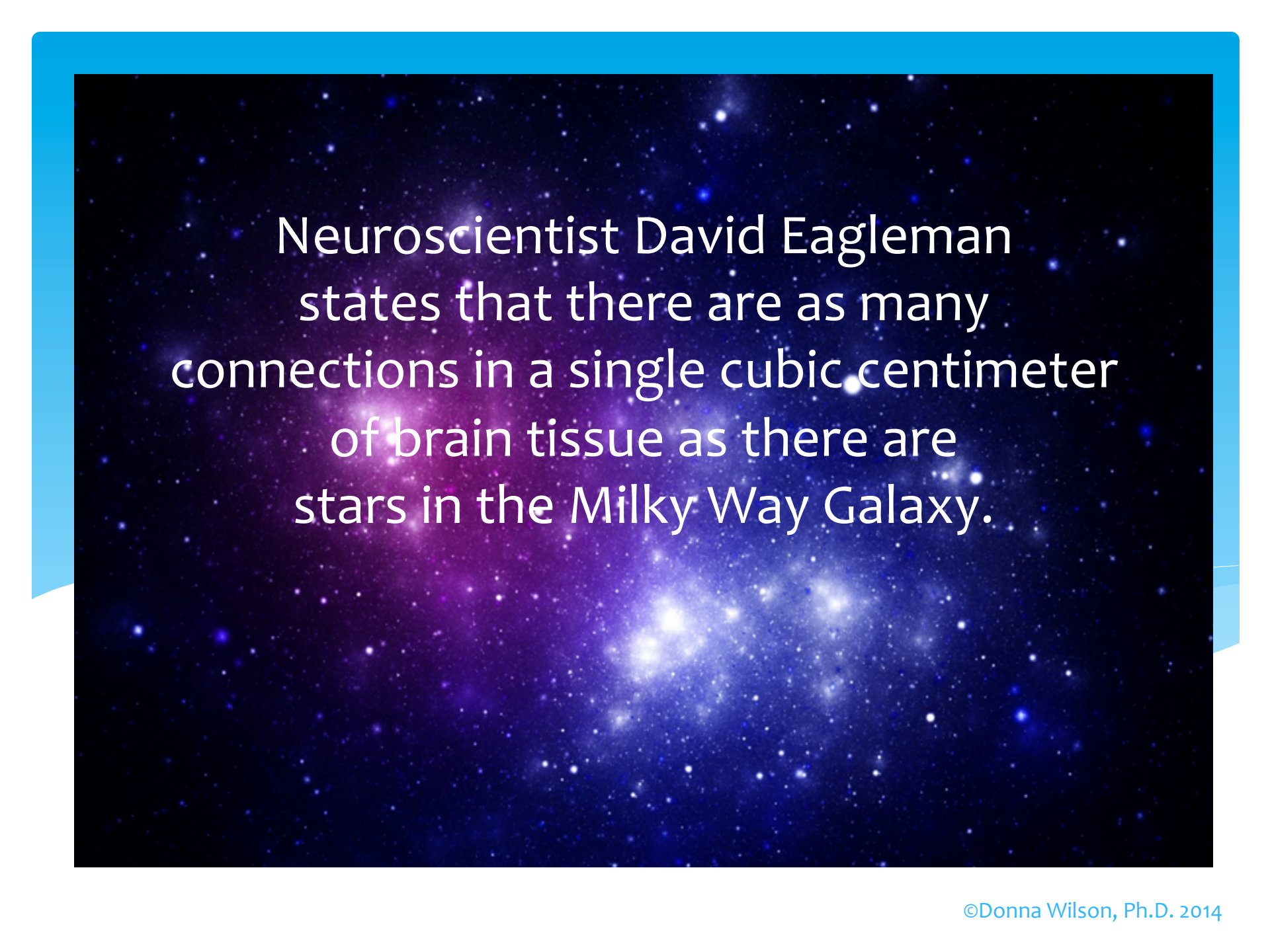
Content x Process (*How to* is our focus) = Results

Teachers at all stages in their careers are keen to learn to teach more effectively so that their children learn more.

D.L. Wilson & M.A. Conyers,
*Five **Big** Ideas for Effective Teaching*

All students (and educators) arrive at school
with brains powered by 85 billion neurons...



The background of the slide is a deep space image featuring a dense field of stars and a prominent nebula with blue and purple hues. The text is centered in white, sans-serif font.

Neuroscientist David Eagleman
states that there are as many
connections in a single cubic centimeter
of brain tissue as there are
stars in the Milky Way Galaxy.

Nobel Prize Winner Carl E. Wieman On Misconceptions in Policy & Practice

“The lack of expertise leads to a lot of misconceptions about learning that permeate government and the public,” he said.

“Among the myths: the belief that ability is inborn, that reading comes naturally, that young children can’t think abstractly, and particularly, the belief that brains are fixed at birth.”

C. E. Wieman, *The Torturous Path
from Cognitive Science to Educational Improvement*

Reading Challenge



“We could teach almost every student to read by the end of first grade.”

Current Practice:

One-third of children read at or above proficient level, one-third at basic level, and one-third at below basic level.

R.L. Arlington,
What Students Need to Learn. p. 40-45

An Exemplar in Policy and Practice

Kennewick, Washington

Fielding, L., Kerr, N., & Rosier, P. (2007).
*Annual growth for all students:
Catch-up growth for those who are behind.*
Kennewick, WA: New Foundation Press.

Reading Changes Learning Outcomes

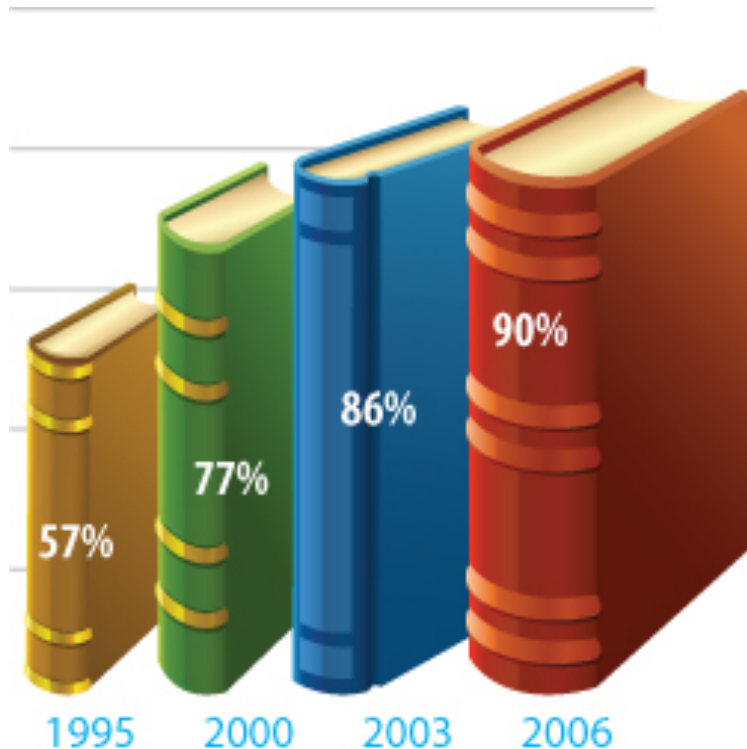


- Kindergarten targets can be achieved when families read with their child 20 minutes a day from birth and spend five minutes a day playing age-appropriate activities.
- Providing targets, tools, and training to families and child-care providers decreases the number of students coming to kindergarten with skills below grade level.

School Readiness: Birth to Kindergarten



- * Schools do not create problems initially
- * 13% children's waking hours in school and 87% at home and in the community
- * Day 1 kindergarten, range of skills is six years in reading and four years in math



In 1995, 57% of third graders began reading and math on grade level.

By 2000, it was 77%; by 2003, 86%; and by 2006, 90% were reading on grade level.

Primary School: K-Grade 3



When students leave kindergarten three years behind in reading, they must make two full years' growth plus annual growth in the first, second, and third grades to be at grade level by the end of third grade. Kennewick accomplished its goal (90%) reading on level by the end of third grade.

Find your exemplars ...



and nurture the spread of successful teaching practices. Support effective teachers and teacher leaders to take them to scale.

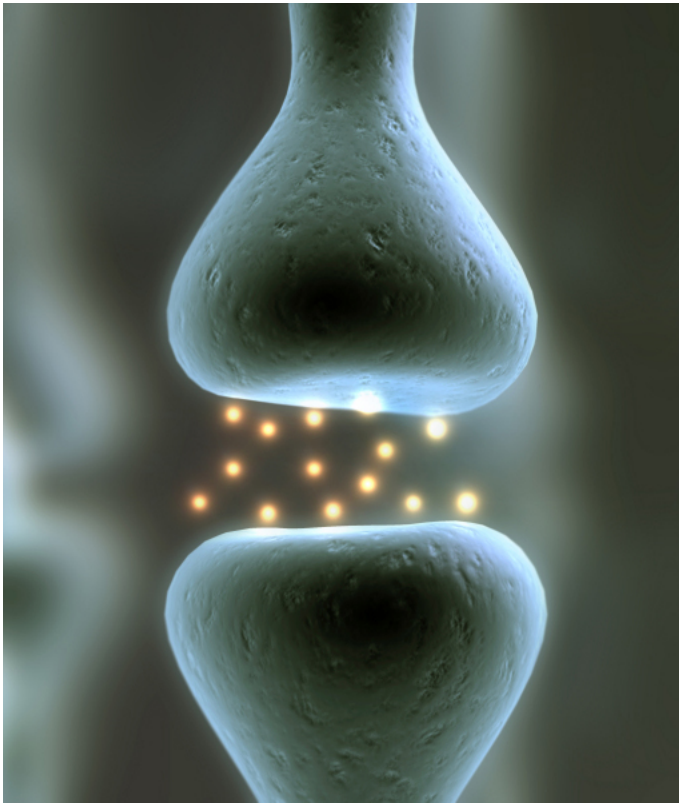
Higher Expectations for All Students Help to Create Classroom Success

Texas teacher Diane Dahl's story of high expectations

“Students know they are treated differently in the classroom due to expectations by teachers, and are quite accurate in informing on how teachers differ in the degree to which they favor some children over others with higher expectations.”

J. Hattie, *Visible Learning*, p. 124

Experience Dependent Synaptogenesis (Brain connections due to environment)



Experience Dependent

Each human becomes different depending on their learning environment.

- * Vocabulary development
 - * Sound-symbol associations
 - * Reading comprehension
 - * Map reading
 - * Playing a musical instrument
 - * Learning behaviors
- * *Five Big Ideas for Effective Teaching*

A large, colorful, tangled structure made of pipe cleaners, resembling a coral reef or a complex sculpture. Numerous small, rectangular labels are attached to the structure, each containing a name. The structure is placed on a wooden table. In the background, there are wooden cabinets and a clock on the wall.

Two Views of Intelligence

- * People who believe functional intelligence is a single, predetermined attribute ... believe intelligence is fixed
- * Have an entity view or fixed mindset
- * Have a performance goal orientation
- * Attribute their successes and failures to external, stable, and uncontrollable causes
- * People who believe intelligence is multi-faceted tend to ... believe intelligence is dynamic, changeable, malleable
- * Have an incremental view or growth mindset
- * Have a mastery goal orientation
- * Attribute their successes and failures to internal, unstable, and controllable causes

Five Big Ideas for Effective Teaching, p. 79

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Robert Sylwester: Think of genes as phenomena that permit rather than limit behavior.

Educators, parents, and communities can act to create the kind of conditions that will provide children with the best adaptations of what nature provided genetically.

In D.L. Wilson & M.A. Conyers,
Five Big Ideas for Effective Teaching p. 33

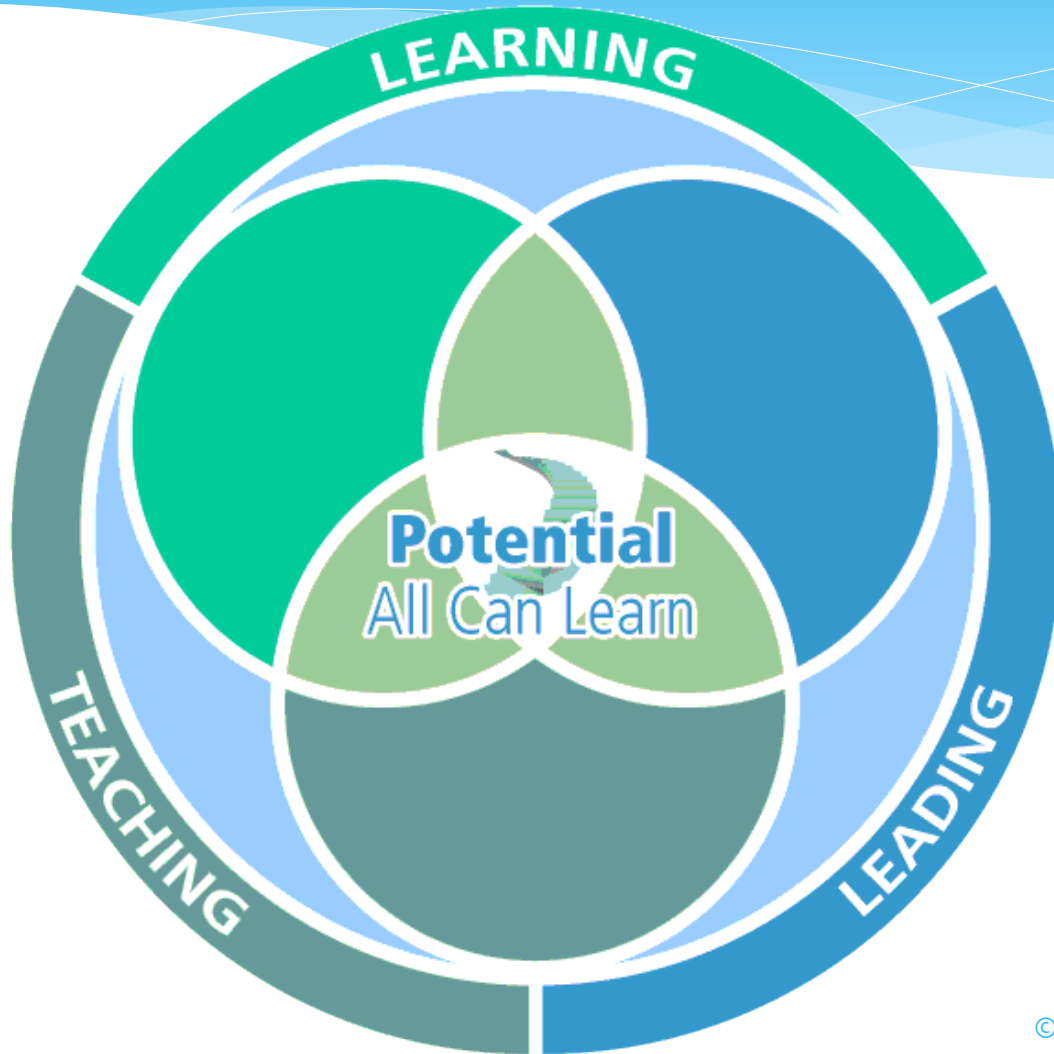
Later today upon reflection, think about... As an educational leader what am I doing to create the best conditions for student learning?



Potential can be redefined as the capacity across the life span, fueled by the brain's plasticity, for acquiring the knowledge and skills to achieve at a higher level of performance when the proper conditions have been created.

BrainSMART

Education, Mind, and Brain Model



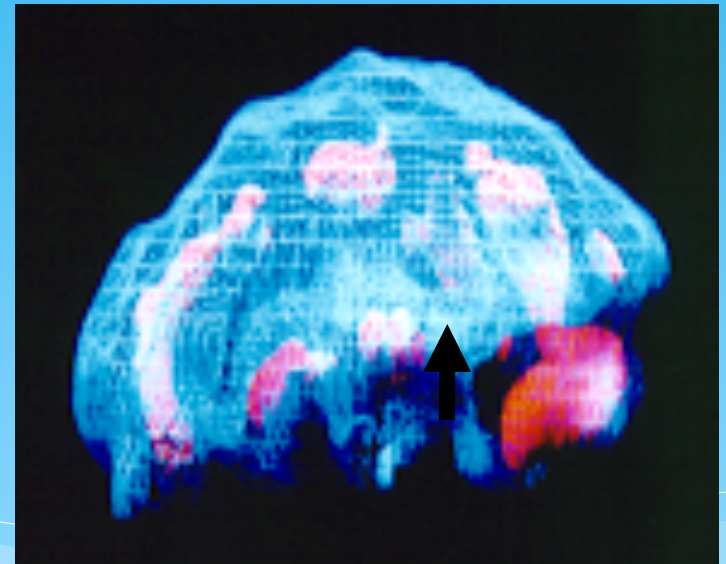
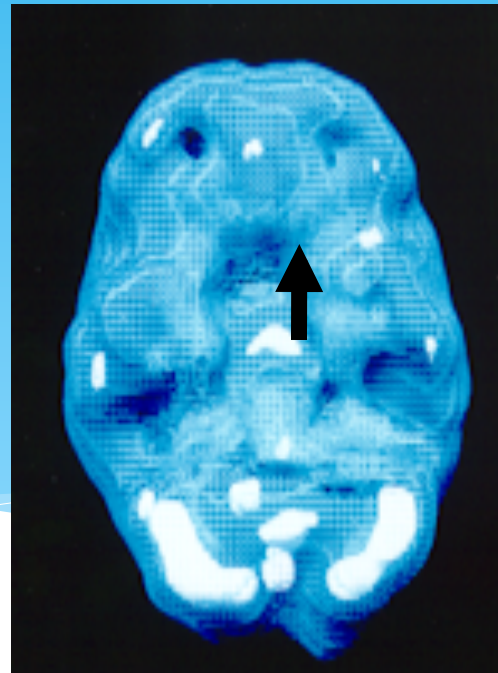
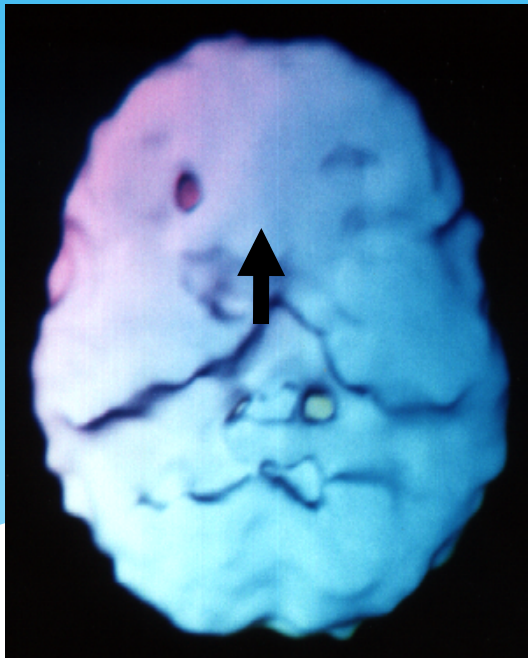
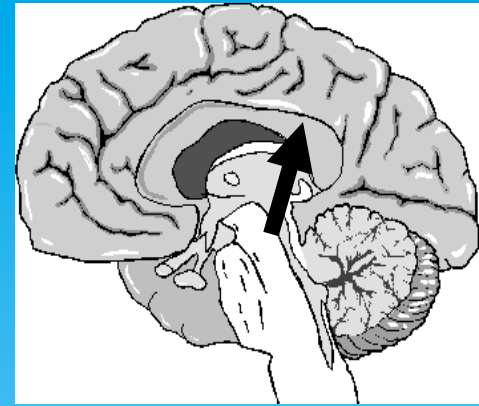
From practice to policy we must act on the belief...

“All children (95%), except the severely disabled, can learn to a high level of critical reasoning and problem solving.”

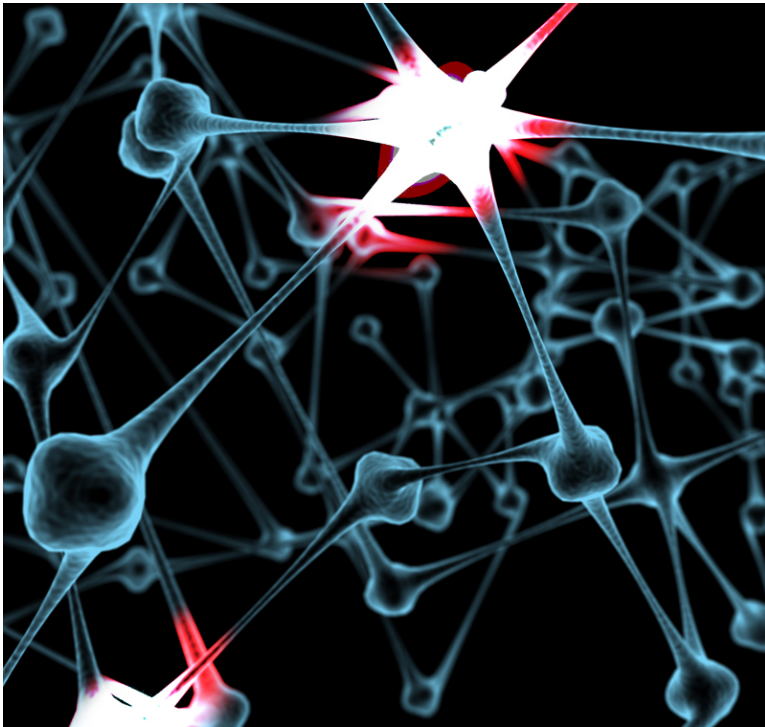
M. Fullan, *All Systems Go*, p. 4

* Key: *Most standards now require that students be able to think at higher levels.*

Learning is primarily limited to situations in which the brain is *engaged*.



Neurotransmitters, Plasticity & Positive Engagement: The 'On' Switch



If I am ...

- * Alert,
- * On the ball,
- * Engaged,
- * Motivated,
- * Ready for action,

then neurotransmitters that enable learning are released. Think of an 'on' switch.

M. Merzenich, *Soft-Wired: How the New Science of Plasticity Can Change Your Life*, p. 46



If you are intensely focused on the learning task,
trying as hard as you can to get better,
the neurotransmitter release rises dramatically and
you are *ready* to learn and *save it*.

However...



If you are barely paying attention, half-trying to learn, and do just a tiny bit better than last time, only a small dose of neurotransmitters are released and you will realize little if any differences.

Engaging Young Minds



Stimulating language, play, word and number games, songs, movement, art, math manipulatives, read-alouds, a print-rich environment, and lots of real, authentic problems to solve are key for engagement to occur. A variety of learning experiences in the first five years of life helps to ensure primary school-aged children are ready to crack the reading code, learn comprehension strategies, develop key math and science concepts, and much more.

D.L. Wilson & M.A. Conyers, *BrainSMART: 60 Strategies for Increasing Student Learning & Flourishing in the First Five Years*

Teach Students Cognitive Strategies as a Method for Becoming Smarter

Recall: Formula for More Effective Teaching:

Content x Process = Results

Large studies and meta-analyses indicate this is important to help students become functionally smarter.

D.L. Wilson & M.A. Conyers,
Thinking for Results

National Science Teachers Association and Early Childhood Education

“Grown-ups – including teachers – tend to underestimate preschoolers’ capacity to learn scientific principles ...

Recommendations:

1. Provide experiences in early years that focus on the content and practices of science, ... &
2. Understand that science experiences are already a part of what young children encounter every day ... encourage children to ask questions, plan investigations, and record and discuss findings.”

J. Blair, *Education Week*,
April 2, 2014, p. 11

Ms. Cabadaidis Teaches Self-Regulation, Gift That Keeps Giving!



My students (ages 3-6) ... “Peter Rabbit wasn’t thinking. He didn’t have self-regulation. He went into Mr. MacGregor’s farm when his mother told him not to, and he got into a lot of trouble. He lost his brass buttons to his new blue coat!”

D.L. Wilson & M.A. Conyers,
Flourishing in the First Five Years, p. 98

How Does a Learning Foundation Look In Policy and Practice

- * Six year range of readiness K
- * Learning is ongoing
- * Thinking strategies can be taught
- * Multiple brain pathways for learning
- * There are different ways of solving problems
- * Shallow learning creates less robust pathways
- * Intervene *early* to teach reading/math
- * Use formative assessments
- * Teach children how to think at higher levels
- * A balanced approach to reading and math (basics *and* thinking)
- * Model and let children tell how to solve a problem
- * Teach conceptually

D.L. Wilson & M.A. Conyers,
Five Big Ideas for Effective Teaching



Influencing and Creating Policy in Support of Effective Teaching

Policy: Australian Institute for Teaching and School Leadership

- * Emphasize the ‘development of collective capacity’ versus the ‘solely assessing individual performance’ orientation.
- * Support districts so that the *learning culture* of schools and districts is the *main event* and integrate any performance appraisal so that it serves the shared learning work.

P. Cole, *Professional Development*

Simple Structure Policy and Practice



Policy leaders:

1. Agree on a small number of key priorities.
2. Are resolute in leadership and stay on message, and
3. Develop collective capacity.

M. Fullan, *The Principal*

Using Learning Science Developing Capacity



- * Provide for effective, focused, long-term P.D.
- * New, inspiring material
- * Use the 80-20% Rule (Pareto Principle)
- * Vision and strategy

D.L. Wilson & M.A. Conyers, *Leading the Way*
(In preparation for publication by TCP)



What should policy priorities be?

Key: Grow teachers' collective capacity through sustained professional development and collaboration.

- * Creating structures for developing collective capacity
- * Facilitating teacher leadership so implementation can go to scale
- * Minimizing time-wasting activities (cognitive load)

Policy Practically Speaking



As leaders, rely on your innovators and early adopters (15-20%) to get the ball rolling. The majority will follow as they see it working. Around 15% will probably not implement right away.

E. Rogers

Diffusion of Innovations

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At the Level of Principal: Support the Power of Social Cognition

Move AWAY from...

- * Focusing primarily on individual teachers
- * Needing to know everything, rather than relying on teachers.

Help ALL teachers increase knowledge and skills by valuing their sharing. Thus, collective capacity is built at the school level.

21st Century Educational Leaders

- * Mastery and passion = competent leader
- * Challenges the status quo
- * Builds trust through clarity of goals and expectations
- * Creates commonly owned plan for success
- * Focuses on team over self
- * Has a sense of urgency for sustainable results
- * Commits to continuous improvement for self
- * Builds external networks and partnerships

L. Kirtman, *Leadership and Teams*

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Edutopia Blogger: <http://www.edutopia.org/user/639986>

