

**Leading Learning at the Edges of the Educational Neuroscience Frontier**

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Paper Accessible at: <http://www.brainscienceforprincipals.com/>

Purpose

“The major purpose of the paper is to advocate for inclusion of educational neuroscience findings about learning and the brain in principal preparation programs. I believe that principals need this knowledge and a commitment to confront the deficit thinking of educators who have not been paying attention, who still believe intelligence is fixed from birth. If programs can equip principals to lead others across that boundary of belief, then learning will be enhanced and social justice advanced.”

Historical Context and Conceptual Overview – See Paper

Methods and Data Sources

National web-based 12-item survey sent to 375 department chairs of universities offering principal preparation programs. Response rate was 18.67%. The 70 responses represented 29 states or 58% of the states that offer principal preparation programs.

Findings

Items about beliefs used forced choice responses – (See Paper). Total respondents numbered from 51-53:

#6. From your perspective, how important to effective school leadership are understanding and applications of recent educational neuroscience findings about the brain and learning? (Extremely important = 11; Greatly important = 22; Moderately important = 13; Somewhat important = 5; Not at all important = 2)

#7. From your perspective, how would faculty who teach in the Principal Preparation Program rate their level of knowledge of recent educational neuroscience findings about the brain and learning? (High = 0; Good = 12; Fair = 30; None = 11)

#8. From your knowledge of course syllabi, to what extent are recent findings from educational neuroscience about the brain and learning emphasized in the Principal Preparation Program? (Minimal = 19; Some in classes with achievement focus = 14; No emphasis = 13; Some in teacher evaluation classes; Strong focus of one class = 7)

#9. Pick four topics from the 10 offered that could contribute the most to a principal’s effectiveness as an instructional leader? See Table #9.

*#9. Composite Ranking in Descending Order of Importance of Neuroscience Topics Contributing the Most to Effective Instructional Leadership of a Principal*

Ranking of topics	Responses as percentages	Responses as numbers*
1. Motivation and mindset	76.49%	39
2. Role of emotion in learning	64.71%	33
3. Effects of stress on learning	52.94%	27
4. Creativity and innovation	49.02%	25
5. Developing metacognition	45.10%	23
6. Nature/definition of learning	35.29%	18
7. Executive functioning	31.37%	16
8. Neuroplasticity and intelligence	27.45%	14
9. Identifying neuromyths	11.76%	6
10. Enhancing short & long-term memory	5.88%	3

\* 51 persons responded

### Open-Ended Questions

#10. “In what ways could a principal’s knowledge of recent educational neuroscience findings about learning and the brain enhance learning and achievement in a school?” Qualitative data analysis revealed three themes in the 33-34 responses:

Theme 1. Establish a culture of professional development focused on learning.

Theme 2. Use instructional leadership role to focus widely on implications of educational neuroscience findings throughout all aspects of the system.

Theme 3. Own and model the knowledge about learning and the brain with a focus on meeting the needs of students.

#11. “In what ways could a principal’s knowledge of recent educational neuroscience findings about learning and the brain contribute to social justice in a school?” Qualitative data analysis revealed three themes:

Theme 1. Create an optimal learning environment that allows for individual differentiation, honoring neurodiversity (every brain is different) as well as other student diversities.

Theme 2. Communicate that intelligence is not fixed and how neuroplasticity makes it possible for all students to learn and achieve successfully.

Theme 3. Deepen understanding of global and institutional social justice issues and remedy the misdistribution of power and influence through policy and practice.

#12. “Should state and national standards for Principal Preparation Programs require inclusion of recent educational neuroscience finding about learning and the brain in content knowledge standards?”

Out of the 34 responses, 16 said Yes, with an additional 5 saying Maybe, making for a total of 21 that were Positive; 2 were Uncertain; and 11 said No.

### Conclusions

This survey research represents a preliminary inquiry into attitudes and beliefs about inclusion of recent educational neuroscience findings about learning and the brain in principal preparation programs. Although 41.51% of the respondents rated the topic as *Greatly Important*, even more telling in terms of knowledge of neuroscience among faculty in the field of educational leadership was the low composite rating of “*Neuroplasticity and intelligence*” at 8th out of 10, toward the bottom of a ranking of topics viewed as contributing the most to a principal’s effectiveness as an instructional leader. The case still needs to be made for how understanding neuroplasticity of the brain changes beliefs about intelligence being fixed at birth. Principals with such understanding lead teachers to growth mindsets.

Donna Wilson and Marcus Conyers (2013) report that “unfortunately, about one-fourth of preservice and in-service teachers believe that intelligence is fixed” (p. 75). Their source is a 2012 study of implicit theories of intelligence by Jones, Bryant, Snyder, and Malone. In spite of neuroscience evidence that the entity view of intelligence is outdated and untrue, if one in every four teachers a child or teenager encounters in school is working from this paradigm then this view is shaping the reality of far too many students.

The neuroplasticity of the brain, meaning that intelligence is not fixed from birth, is a foundational understanding. Findings from educational neuroscience make higher and deeper levels of learning more possible for all learners, and enhance the potential of education to advance social justice. To repeat the words of a survey respondent: “All learners being successful *IS* the definition of social justice.”

The pervasive influence of deficit thinking about the limited learning potential of some students will not stand up to the influence of the developing knowledge about the brain and learning. Neuroplasticity and its ramifications for learning must break through old boundaries of understanding in order to shape a new normal. With continued advocacy and by equipping principals to take leadership of learning to the edges of the educational neuroscience frontier, we advance social justice.

Looking to the future, the challenge is taking action to ensure that educational neuroscience findings about learning become part of the education of every principal. Clearly this will likely not come about through adoption or imposition of a set of standards. It takes time to cross a frontier. Reaching the goal of neuroscientifically literate principals is more likely to come about as principals leading from this knowledge base share the learning successes of their students. Each of us has a responsibility to share increasing evidence of how knowledge of educational neuroscience findings can make a world of difference for the children and young people of the world.

How can principals informed by the learning applications of educational neuroscience remake the experience of schooling as teaching practices, school leadership, and policy are shaped by a new paradigm? Crossing that frontier begins with principals who understand and are able to talk knowingly from a neuroscience perspective. Knowing how the brain works is the key to the future of education.