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**A Brain-Targeted Teaching Framework:  
Modeling The Intended Change In Professional Development**

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**Abstract**

This study examined a convergence of two important educational concepts: learning sciences research and professional development. Research in the learning sciences continues to evolve with ongoing technological advancements that are allowing for a deeper understanding of brain function. Professional development is designed to aid educators in expanding their practice based on current trends and research. This study examined how a professional development learning session designed to inform educators about brain-based concepts and brain-targeted teaching strategies impacted educator awareness and knowledge of brain-based concepts for teaching and learning, as well as influenced these educators' pedagogy in the classroom.

**Aim**

Disconnectedness between science and education often exists, creating a barrier to the improvement of pedagogy. Educators' lack of current knowledge and understanding of brain-based learning (BBL) and its implications can stifle the necessary evolution of learning in the classroom. By infusing a professional development learning session with brain-targeted strategies, as guided by the six focus areas of Hardiman's Brain-Targeted Teaching (BTT) Model (2012), it was hypothesized that the educators' experiences would deepen and extend awareness, and ultimately, increase the use of brain-targeted strategies in the classroom.

**Problem and Purpose**

Professional development has long been a cornerstone of teaching and learning. Its purpose is to promote the utilization of effective pedagogy thus stimulating student growth and achievement. Quite simply, research maintains that when educators learn, students learn (Desimone, 2011; Webster-Wright, 2009). Educational theorists and research maintain that to properly prepare for instructing students, educators must first experience the processes of acquiring, interpreting, managing, and applying new knowledge to gain understanding (Stein & Fischer, 2011; Willis, 2010). To that end, and in attempt to bridge the disconnectedness between science and education, a professional development learning session titled "Brain Targeted Teaching", offered as part of this study, was designed with the following goals: (a) to provide educators with brain-based research information with implications for teaching and learning, (b) to afford an opportunity for educators to experience a BTT model as learners, and (c) to model the BTT framework for use in the classroom.

**Methodology**

An explanatory sequential mixed methods approach was utilized to explore the impact of a professional development learning session designed to model the change it intended to promote, namely the exploration and application of BBL and BTT concepts and strategies. This

mixed methods design allowed for the collection and subsequent analysis of complementary quantitative and qualitative data, capitalizing on the strengths of the two methods, and provided a comprehensive overview of the research. Forty-four K-12 public school educators enrolled in the professional development learning session participated. Data was collected from a pre survey and two post surveys; understanding of this data was augmented by semi-structured one-on-one interviews with five of the participants, and the reflections of the researcher.

### **Research Findings**

The post session data demonstrated an increase in educator awareness and knowledge of brain based concepts exhibiting gains between 15% and 43% in knowledge and an average increase of 30% in awareness when compared to the pre session data. The data also evidenced an increase in frequency of strategies applied in the classroom. Over 75% or more of the participants reported an increase in the application of each of the BTT strategies as a result of their experiences in the learning session. The application of these strategies appeared to be significant as the 66% of educators that responded to the delayed post survey universally noted increased student engagement following the pedagogical changes they made.

### **Discussion**

This study evidenced that modeling strategies can be a cornerstone in professional development as it provides an observable framework as well as an opportunity for first-hand experience of the intended outcome. The researcher concluded that educators benefit when introduced to learning concepts via experiential learning. The following conclusions emerged from the data:

- Increased awareness and knowledge of research from the learning sciences can guide instructional decisions.
- Modeling BTT strategies in professional development learning sessions increased usage in the classroom.
- Implementation of BBL and BBT concepts for teaching and learning are reported to increase student engagement.

Information from this study provided a greater understanding of the value of professional development learning in the areas of BBL and BTT, as well as the impact research from the learning sciences has on teaching and learning.

### **Research Implications**

Implications from this study support the recommendation of several educational theorists (Hardiman, 2012; Stein & Fischer, 2011) to strengthen the relationship between learning sciences research and teaching and learning. Professional development should continue to evolve as learning sciences research continues to expand and inform instruction, thus affording educators the opportunity for instances of short and long-term implementation. To that end, the following five recommendations are offered for consideration in educational settings: (1) establish a professional development plan for teachers to gain competency in BBL and BTT; (2) develop a guide for professional development facilitators in modeling elements of BBL and BTT delivery; (3) adopt a framework to build capacity in knowledge of instruction based on research from the learning sciences; (4) create a plan for educating students about the brain; and (5) encourage professional learning as a means to continue exploration of BBL and BTT concepts.

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## Author Biography

Dr. Tara L. Parr is a recent Drexel graduate, having earned her Ed.D. in December 2016. Her epistemological view of knowledge acquisition aligns with the constructivist theory of making meaning through active participation. She maintains that learners learn-by-doing and, as such, she is very passionate about effective design of professional learning opportunities for K-12 educators. She is also intrigued by research on the learning sciences, and the wealth of information afforded to educators regarding how the brain functions and learns. A convergence of the two education topics, professional development and Learning Sciences research, seemed a natural progression for her research.

In her full time position, Tara serves as the Technology Integration Curriculum Coordinator in a Pennsylvania K-12 public school district. She is married and spends most of her free time supporting her two children, Maddie (17) and Nicklaus (12), in their activities. She loves to bake and is an avid binge watcher, most recently completing HBO's series *The Wire*.