Bringing Brain Research Into Teaching

The purpose of education, one might argue, is to teach children to become more efficient thinkers, making smart social, emotional, and academic decisions. Yet our existing school structures have not explicitly focused on enabling teachers to understand how children think and learn and how to improve their problem-solving and reasoning skills. We have spent the past six years at Jacob Shapiro Brain Based Instruction Laboratory School developing a new culture emphasizing both academic achievement and critical thinking.

Bringing Brain Research Into Teaching aims to teach children to make smart decisions in a systematic, intentional, and sequential way. To implement this model, teams of teachers explored various brain-based programs to better understand neuroscience facts and myths, including an MBE course from the Harvard Graduate School of Education. Based on this information, we sifted through educational tools and categorized them into one or more of four areas:

1. **Instructional strategies** increase the brain’s capacity to learn and change the emotional state of learners.
2. **Enriched environments** encourage optimal learning conditions in school, at home, and in the community.
3. **Deficit correction/cognitive enhancement** builds the foundation for critical thinking.
4. **Evaluation tools** provide feedback to learners, teachers, parents, and community members.

A Brain-based School

In July 2005, the principal and four teachers from Jacob Shapiro attended Eric Jensen’s conference, “Teaching with the Brain in Mind.” That training forever changed the way we thought about the purpose for schooling and the possibilities for every child. We learned that a child’s brain structure and chemistry change every day, and that environment and experiences in the classroom and throughout our school have a profound impact on these changes. We used a charter school grant to broaden the options for learning at Jacob Shapiro based on findings from neuroscience research, affording our entire staff the opportunity to learn how to read and regulate the emotional states of learners, teach specific thinking skills, and mediate student learning.

We applied the Mind, Brain, and Education (MBE) model espoused by Harvard professor Kurt Fischer, which aims to teach children to make smart decisions in a systematic, intentional, and sequential way. To implement this model, teams of teachers explored various brain-based programs to better understand neuroscience facts and myths, including an MBE course from the Harvard Graduate School of Education. Based on this information, we sifted through educational tools and categorized them into one or more of four areas:

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Although our curriculum largely mirrors what is used elsewhere in the Oshkosh Area School District, we added Instrumental Enrichment, an independent curriculum designed to teach explicit thinking skills and then bridge those skills to other academic and social areas. For example, we routinely teach our children to identify a problem, devise a plan, and shift strategies when one isn’t working. Additionally, our teachers know how to apply specific principles from neuroscience to help children to become more self-regulated, efficient thinkers.

Teachers at Jacob Shapiro are trained to implement an MBE model in the following sequence:

1. Understand brain-based principles.
2. Create a classroom and school community using Becky Bailey’s Conscious Discipline brain state model.
3. Use the language of an effective classroom community.
4. Systematically teach thinking skills.
5. Understand the language of mediation.

Connecting Mind, Brain, and Education

To apply the MBE model, adults in a child’s life must understand that systems of the brain responsible for impulse control, critical thinking, and other self-regulation functions do not mature until around age 24. In addition, our tools for teaching in the 21st century must be multidimensional rather than one-dimensional. Previously, preparation involved training people for a specific job, or giving them a skill set so they had the competencies to do that job—the what of learning. Now, preparation must provide students with tools to ask and answer how and why in addition to what, so they can work in jobs yet unknown or on problems yet to be defined.

Principals need staff members to learn and implement two approaches to MBE model implementation in particular. First, they must effectively read and regulate learners’ emotional states. Research suggests that students
who are in a positive emotional state are more engaged and will likely learn more. For example, a few minutes into a third-grade math lesson, students appeared lethargic—slumped over and un-engaged. The teacher quickly used an energizing technique called “Silent Sports.” She told everyone to stand up and then called out, “What is the product of 5 and 8?” She chose a student, who called out the product and then named a sport, in this case basketball. All the students silently dribbled an imaginary basketball around their learning area. Then the teacher led the class in a “balloon breathing” exercise before they returned to their seats. The whole process took two minutes. Students were clearly refocused and ready to continue the lesson.

Second, teachers must explicitly teach thinking skills, such as using precise language, logical reasoning, accurate labeling, planning strategies, spontaneous comparisons, and error analysis.

We also need to teach children in ways that draw on their strengths, which helps them make greater connections while teaching them to analyze their errors. For example, in a fifth-grade classroom, students are taught spelling using modalities that honor their strength areas. After students find patterns in the words they are working with, they do activities to reinforce that learning. These include approaches that are oral (spelling out loud), visual (writing in different colors), musical (rhyming the words), artistic (drawing pictures of the words), and kinesthetic (writing the words with their fingertips on a gel-filled plastic bag).

Positive Outcomes
The data we’ve collected indicate that using an MBE approach has improved student achievement and school culture. For the 5-year-olds in our early childhood special education program, pre- and post-evaluation using the Developmental Tasks for Kindergarten Readiness II assessment tool has demonstrated statistically significant improvement for each of the four years we have used the neuroscience-based approach. For example, in 2010-2011, the overall composite quotient for students in this classroom went from 80.57 to 112.00. This increase could not be attributed to maturation alone.

Three years of Measures of Academic Progress assessments given to the group of students who are now in sixth grade indicate growth as well. These results include students who are English-language learners and those identified with various disabilities. Students’ Math RIT scores are significantly above the national norm. It is particularly noteworthy that the fifth-grade students’ score of 224.8 already surpasses what is expected of the sixth-grade norm of 223.8. In addition, surveys reveal that students at Jacob Shapiro believe their education falls within the realm of personal responsibility, that students are taking more ownership of their learning, and that parents are gaining an understanding of their role in that process.

Evidence-based Practice
While there are no silver bullets in building strong learners, we know that scientific evidence is changing our common beliefs about human development and supports the notion that purposeful intervention can change the brain at any age. What we do in the classroom and throughout our school has a profound impact on strengthening each student’s social and cognitive systems. Our journey to use neuroscience as the foundation for learning at Jacob Shapiro comes at a pivotal time when critical analysis, problem solving, and collaboration are becoming essential not only for survival but also to remain competitive in a global economy. 

B. Lynn Brown is principal of Jacob Shapiro Brain Based Instruction Laboratory School in Oshkosh, Wisconsin.