

# The Mind-Body Connection

## Practical Applications of Brain-Based Learning

**B**rain-based or brain-compatible learning is a hot topic these days! It is easy to get caught up with the new ideas when you read Eric Jensen's *Teaching With the Brain in Mind*.<sup>1</sup> And even more so when you hear Jensen present and put in practice what he preaches and writes about.

Both hearing and reading Marian Diamond's compelling arguments from *Magic Trees of the Mind*<sup>2</sup> puts one squarely in the brain-compatible learning camp! At the same time, others, like John Bruer,<sup>3</sup> invoke caution in the application of brain research. He believes that "we have little understanding of what [brain] research might mean for education."

Despite Bruer's cautions, overwhelming evidence supports the strong connection between learning and physical health. Even a cursory reading of the brain-research literature provides support for the concepts

that Ellen White wrote about in the late 1800s.

"Pure air, sunlight, abstemiousness, rest, exercise, proper diet, the use of water, trust in divine power—these are the true remedies. Every person should have a knowledge of nature's remedial agencies and how to apply them."<sup>4</sup>

Although this advice was given in the context of illness, these remedies can also keep us healthy. Do these principles also apply to education? Brain re-

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searchers and educators certainly do believe they are related. Here are some examples:

### **Pure Air**

Jensen supports the idea that pure air is necessary for optimum brain function: "Oxygen is, of course, critical to the brain. The brain uses one fifth of the body's oxygen . . . Higher levels of attention, mental functioning, and healing are linked to better quality air (less carbon dioxide, more oxygen)."<sup>5</sup> Numerous researchers point out the harmful effects of breathing cigarette smoke and other airborne chemicals.

### **Water**

Hannaford<sup>6</sup> states that dehydration is a common problem in school classrooms, leading to lethargy and impaired learning. Levine and Coe<sup>7</sup> suggest that if water is available in the learning environment, this greatly diminishes stress levels. Water both prevents dehydration and helps cleanse impurities from the

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## Some Remedies That Keep Us Healthy

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system. This is a compelling argument for encouraging students to drink water during the school day!

### Diet

Proper diet and its relationship to learning are an important theme in brain literature. Sprenger says proper diet helps produce neurotransmitters, which are important for learning and long-term memory. She lists some foods that are necessary to produce the neurotransmitters, such as acetylcholine, a protein:

"If you have to be alert for most of the day, it makes sense to start the day with three or four ounces of protein. You may eat small amounts of carbohydrates with your meal. . . . A protein-rich lunch will continue to keep you 'on your toes' for the afternoon. Save most of your carbohydrates for late afternoon or for your evening meal. This is a time when you will probably be more able and willing to relax."<sup>8</sup>

For optimum learning, students need sufficient calories and numerous nutrients. These include proteins, unsaturated fats,

green leafy vegetables and fresh fruits, complex carbohydrates, and sugars. The brain also needs a wide range of vitamins and minerals such as calcium, boron, selenium, vanadium, and potassium.

### Exercise

Exercise clearly enhances learning.<sup>9</sup> This probably occurs through the laying of neural pathways. Exercise also increases blood flow throughout the body, sending more oxygen to the brain. A number of studies have revealed that children who engage in daily physical education or who exercise regularly show superior motor fitness and academic performance, better memory skills, and more positive attitudes toward school. All K-12 students need 30 minutes a day of physical movement to stimulate the brain, according to the U.S. President's Council on Fitness and Sports.<sup>10</sup>

### Rest

Extensive research has shown the need for young people to get adequate rest. The brain activity that occurs during sleep is critical memory maintenance and physical renewal. Growing children need eight to nine or more hours of sleep per night.

Students are falling asleep in class at an alarming rate. The assumed culprits, part-time work and going to bed late, may not be the primary cause. Puberty appears to be a major factor. Richardson describes the problem in graphic terms: "We have kids so sleep-deprived it's almost as if they were drugged. Educators like myself are teaching walking zombies."<sup>11</sup>

Because a teen's natural sleep clock generates a natural bedtime closer to midnight, with a waking time close to 8 a.m., starting the school day later might help middle school and high school students get more rest, con-

solidate their learning, and improve their behavior.

“Middle and high schools ought to start later than elementary school. While 7:30 a.m. is appropriate for the primary levels, a 9:30 a.m. start usually works better for middle and high schools.”<sup>12</sup>

### **Abstemiousness**

Abstemiousness means avoiding practices that will harm one's body. This includes the use of illegal substances as well as the abuse of over-the-counter and prescription medications. Caine and Caine are very emphatic about the damage to learning from harmful substances: “Because many drugs, both prescribed and recreational, inhibit learning, their use should be curtailed and their effects understood.”<sup>13</sup>

Current research and educational writers are substantiating the Seventh-day Adventist temperance stand, “eliminating the harmful while using wisely that which is good.”

### **Trust in Divine Power**

According to Ellen White, “If we educated our souls to have more faith, more love, greater patience, a more perfect trust in our heavenly Father, we would have more peace and happiness as we pass through the conflicts of this life.” “Believing brings peace, and trusting in God brings joy.”<sup>14</sup>

While there is no brain-research literature that directly deals with trust in God, there are studies on the effect of stress on learning. “Emotionally stressful school environments are counterproductive because they can reduce the students' ability to learn. A sense of self-esteem and control over one's environment are important elements in managing stress.”<sup>15</sup> “[D]istress not only interferes with health and physiological functioning, but also inhibits cognitive functioning. It impedes our capacity to think, solve problems, and perceive patterns because of the inseparability of body, emotions, and intellect.”<sup>16</sup>

While we cannot eliminate all stress from students' lives, trusting in God's power, while claiming His forgiveness and the assurance of salvation, can provide us and our students with a basis for maximizing learning.

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VirLynn Burton's 5th-graders at Loma Linda Academy (California) take a “water break.”

## **Proper diet and its relationship to learning are an important theme in brain literature.**

With this background, I would like to report the implementation of “brain-based teaching” in several classrooms. Recently, several teachers have made it a point to see that students have fresh air, water, exercise, a proper diet, and an emotionally safe place to learn. Here are some interesting results for three different levels: primary grades 2/3, grade 5, and an undergraduate secondary-methods class.

**L**ast year, when Rob Robinson taught the 2nd and 3rd grades at the Adventist church school in Riverside, California, he applied a number of brain-research principles in his classroom.<sup>17</sup> Throughout each school day, he set a timer for every 15 to 20 minutes. The timer was tended to by one of the students, who happily informed him when it was time for a break. During break time, teacher and

students engaged in physical activity ranging from standing up and taking a few good breaths of air for 45 seconds to going out on the playground and walking for three to five minutes. This simple procedure dramatically reduced discipline problems! The planned breaks made a real difference in the classroom atmosphere and learning.

During the breaks, learning continued, as students talked to one another, sang content-related material, and looked for objects related to the lesson. Break time does not have to be down time in terms of instruction.

### **Fifth Grade**

VirLynn Burton, a 5th-grade teacher at Loma Linda Academy in Loma Linda, California, also schedules regular breaks, while incorporating other brain-research findings. She requires each student to bring a water bottle to school, and allows her class to eat during school time. Only certain foods are permitted. No candy, no soda, no high-sugar foods—only nuts, raisins, raw vegetables, crackers, etc., can be consumed.

Traditionally, schools have not allowed students to eat during class time. However, teachers and administrators often forget that many students come to school with no breakfast or at best a poor meal that they ate very early in the morning. To require them to wait until noontime to eat is just too long.

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Ms. Burton found that even though students were allowed to eat in class, only 30 percent of them actually brought snacks. She reports that the students are more focused and have a better attitude toward learning since the introduction of snacks, water, and exercise.

#### **Secondary Methods Class**

My twice-weekly undergraduate class in secondary methods for teachers meets for two hours in the late afternoon, certainly not an ideal time. At the beginning of the course, I supply each student with a bottle of water and a disposable camera. I encourage students to drink water and model this by my own example. The camera has two functions. First, recording the various teaching strategies modeled in the class. Second, encouraging students to move about in the classroom.

If the class requires long periods of sitting and listening, I schedule regular water and exercise breaks. In the past, many students would fall asleep during these classes—and I would feel like falling asleep myself—but that has changed since I implemented these simple strategies.

#### **Implications for Teachers**

As I discovered in my secondary-methods class, teachers, too, need to apply the seven remedies to their own lives—getting enough sleep, taking time to rest, eating a good diet, etc. Jensen<sup>18</sup> says that teachers need breaks and “down time” to process information and plan for future classes, so they don't become

# Exercise clearly enhances learning.

overloaded and overwhelmed. Administrators need to consider the physical, emotional, and spiritual needs of teachers in their plans and demands to ensure quality teaching and reduce burnout. A healthy and happy teacher will have happy students and happy parents—a wonderful learning environment!

Education must combine the intellectual, emotional, and physical. Brain research gives us more evidence than ever of the need for a wholistic education. Through the involvement of the mental, physical, and spiritual powers, we can educate the whole person and prepare our students for the school of the hereafter. ☞

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10. Reported in *ibid.*, pp. 86, 87.
11. L. Richardson, "Teens Are Not Early Risers," *San Diego Union Tribune* (January 3, 1996), p. E1.
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15. Robert Sylwester, *A Celebration of Neurons: An*

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Students in the author's secondary methods class take an exercise break.

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**Water bottles and disposable cameras play a starring role in the author's secondary methods class.**

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- Educator's Guide to the Human Brain* (Alexandria, Va.: ASCD, 1995), p. 77.
16. Caine and Caine, p. 72.
  17. This year, Robinson is teaching kindergarten at San Francisco Junior Academy in northern Califor-

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