Turning Knowledge Into Practice

Early development is in its heyday. Public awareness is at an all time high. What's all the fuss about? With the daily revelation of knowledge about the human brain from the medical community, we now have access to exciting new information that can strengthen our teaching and ensure that we offer children the best possible foundation for learning. The art of teaching is now shaking hands with the science of teaching. We have scientific support for much of what we have long known is the best way to teach young children. In addition, we have information that allows us to use those strategies and techniques not only with renewed confidence but also with a greater depth of understanding of how those strategies actually work. This article will take a few of the many findings that have emerged from the medical research and offer suggestions for ways to translate those findings into classroom application. You may be surprised to find out how many of the suggested activities you are already implementing in your classroom.

➤ Finding: The brain needs to be properly hydrated in order to be alert.

Children who do not get enough water may appear bored, listless, and drowsy. Researchers recommend that we drink 8-15 glasses of water a day. Caffeine and sugar deplete the body of fluid and therefore cannot be substituted for water. Brain researchers suggest using pure water to ensure that it is free of contaminants.

➤ Classroom Applications:

- Allow children to have water when they ask for it. At first they will need to go to the bathroom more frequently, but eventually their bladders will adjust. Keep a pitcher of water available in the classroom. Encourage children to keep water bottles in their lockers. Serve water with snacks.
- Provide straws and two cups of water. Encourage children to drink the water until one cup is half full and the other cup is empty. Do the same activity, changing the focus to counting sips of water. How many sips of water are in the cup? If children aren't counting yet, have them use tally marks.
- Provide ice cubes in a ziplock bag and let children crush ice with a block. Invite them to eat the results of their crushing. This could also be a good lesson on force.

by Pam Schiller

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➤ Finding: Small muscle exercise stimulates brain growth.

Constant manipulation of the fingers seems to stimulate the mind as much as the hands. Several researchers have confirmed that stimulation of the whole or parts of the body can stimulate the brain. Laboratory animals that were allowed to work with manipulatives for an hour a day for three months showed an increase in both size of and connections in the brain.

➤ Classroom Applications:

- Provide finger play activities every day.
- Use clapping and dancing activities for creative movement. "Who Stole the Cookie from the Cookie Jar," "Open, Shut Them," and "If You're Happy and You Know It" are great finger action songs.
- Provide water play activities that exercise the small muscles, such as using eye droppers, sponges, or basters to transfer water. A bar of soap provides both a nice tactile activity and an opportunity to work small muscles.

➤ Finding: Aromas affect alertness and attention.

There is a strong link between the olfactory gland and the nervous system. A Chicago researcher found that certain floral odors increase the ability to learn, create, and think. Other aromas have also been found to boost attention and learning. Peppermint, basil, lemon, cinnamon, and rosemary are linked to mental alertness. Lavender, chamomile, orange, and rose are used for relaxation and calming.

➤ Classroom Applications:

- Provide cooking activities that release aromas that increase alertness. For example, cinnamon rolls, peppermint candies, and lemonade offer opportunities to smell aromas that encourage mental alertness.
- Use scented play dough. Substituting one tablespoon of massage oil for one of the two tablespoons of oil suggested in most play dough recipes makes great scented play dough.
- Encourage children to use scented markers for writing and drawing activities. Create your own colored markers by dipping dried up markers in scented dyes or paints.

➤ Finding: Cross lateral movements keep both sides of the brain working.

Researchers say the use of cross lateral motions can have a dramatic effect on learning. Cross laterals are arm and leg movements that cross over from one side of the body to the other. Since the left side of the brain controls the right side of the body and the right side of the brain controls the left side of the body, the two sides are forced to communicate when the legs and arms cross over.

➤ Classroom Applications:

- Start each day with exercises that require cross lateral movements, such as twisting at the waist with arms stretched to the side or bending at the waist to touch left hand to right toe and right hand to left toe.
- Sing songs and repeat chants that are accompanied by hand motions that cross the midline of the body, such as "Hot Cross Buns" and "Patty Cake."
- Dance with streamers and scarves during creative movement.

➤ Finding: Emotions boost memory.

Emotions play an important role in both memory and motivation. When emotions are engaged, the brain is activated. Emotions create a release of chemicals that act as a memory fixative. We all remember our *lowest* lows and our *highest* highs. Engage emotions in the classroom. Get children involved and excited.

➤ Classroom Applications:

- Discuss emotions with children. Help them understand that our emotions help us express ourselves, work out problems and conflicts, and keep balance in our lives.
- Be expressive! Show your own emotions (enthusiasm) for what you're teaching. Provide humor. Tell child-sized jokes on occasion.
- Add surprises to instruction. Invite a funny or interesting character to *pop in* to the classroom to deliver

some important information. Let a *phone call* interrupt a lesson to provide additional information. (If a real phone is unavailable, just use a play phone and make believe there is a caller.)

➤ Finding: Novelty increases attention.

Memory is increased when an activity or event is new and different. The brain pays closer attention to things that don't fit the pattern, that are not routine.

➤ Classroom Applications:

- Rotate shelf toys and equipment. Rotate books on the library shelf.
- Work puzzles upside down. String beads on laces that hang from the ceiling. Try riding tricycles backwards.
- Change names of traditional games. "Simon Says" can become "Chuckie Says," "Duck, Duck, Goose" can be "Dog, Dog, Cat."

➤ Finding: Patterns are used by the brain to organize information.

A pattern is a design, a number of elements or objects arranged in a formal or regular manner. A pattern can also be a model of behavior, or a combination of acts, qualities, etc., regarded as characteristic of persons or things. The brain organizes information by creating meaningful patterns. New information is evaluated against existing patterns, sense and meaning are applied, and understanding begins.

➤ Classroom Applications:

- Watch for visual patterns in the environment like shadows on the floor, lines in the carpet, window arrangement in buildings, and so on. Point out the patterns and encourage children to look for patterns on their own.
- Discuss patterns in your daily schedule. Are active activities followed by quieter activities? Does story time always follow outdoor play? Do children go to the lunchroom by age from youngest to oldest class? What about activity, transition, activity, transition?
- Watch for patterns in behaviors. Isn't it interesting that friends are more willing to share when you ask them nicely? Notice how everyone gets a little cranky around lunch time? How many people are tired after lunch?

➤ Finding: Problem solving strengthens neural connections.

Problem solving is one of the brain's favorite exercises. Problem solving causes synapses to form, neurotransmitters to activate, and blood flow to increase.

➤ Classroom Applications:

- Teach children the process that is inherent in problem solving.

Step 1: Identify and articulate the problem.

Step 2: Brainstorm possible solutions.

Step 3: Evaluate possible solutions in terms of resources required.

Step 4: Select one of the solutions.

Step 5: Try it out.

Step 6: Evaluate the results. If first choice of solutions didn't work, go back to Step 3 and try again.

- Read stories that are focused on problem-solving, such as *Stone Soup, Swimmy, The Three Billy Goats Gruff, Moira's Birthday,* and *Fish Out of Water.* Encourage children to evaluate the solutions. Can they think of other ways to solve the problem?
- Set up problem-focused scenarios and encourage the children to come up with solutions. For example, Richele and Sam are playing with Sam's new trucks. When Austin shows up to play, there are three children but only two trucks. How many ways can you think of to involve Austin in the play?

➤ Finding: Reward/praise can negatively impact learning.

Overdoing praise can cause children to become overly dependent on external rewards. Dependence

on external rewards inhibits the development of self-esteem, lowers self-confidence, and takes the joy from learning.

➤ Classroom Applications:

- Replace praise with feedback. For example, instead of saying "That's a great painting, Tiffany," you might say "The red and yellow colors you used for the trees helps create a fall look to your painting, Tiffany."
- Use encouragement instead of praise. For example, "I can tell you have put a lot of effort into your drawing."
- Eliminate the use of stickers and privilege rewards. Help children learn to accept the completion of task and accomplishment of goals as rewards in and of themselves.

We have a golden opportunity to take a major step forward in our understanding of human learning. As the research from the neuroscience community continues to unfold, we need to be ready to translate it into appropriate activities for our classrooms. It is our part of the partnership that is developing between science and education.

The list of findings and suggestions in this article just scratch the surface of a body of research that holds a wealth of promise for future generations. Read everything you can get your hands on and, as you develop activities for your classroom, think "brain, brain, brain."

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