

Ongoing Discussion “Thought Piece”

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Vision Dominates Thinking

Leslie Peters

How We Sense is How We Think

Thinking is what makes us human. It is what makes each person utterly unique. But what makes us think? The answer is sensory processing or how our senses take in and use information from our environment. That processing is directly related to the individual development of each person's senses and how those senses integrate with each other. We commonly assume the people around us see what we see, hear what we hear, and have the same reality we have. This is a misconception. Each person does not take in information the same way as the next and a smarter, more effective person is likely one with more highly developed senses as opposed to only the person who has acquired more information. There is disagreement among neurologists as to the number of senses and their definition, but the medical and therapy world generally goes beyond the five we are taught in grade school. Vestibular, proprioception, and pain are frequently included with the traditional five as areas educators and therapists work to develop in order to improve learning and performance.

By far the dominant sense is vision. According to Dr. Thomas Albright, director of the Salk Institute's Vision Center Laboratory (<http://www.salk.edu/faculty/albright.html>), "Visual processing takes up more of your cerebral cortex than every other sense combined." The cerebral cortex is where higher level functioning like invention and analysis, takes place. Unrelated to 20/20 eyesight, visual "processing" refers to visual efficiency and perceptual skills, which can greatly impact the speed at which we take in and mentally manipulate visual input. This is critical because visual input makes up 80% of information that enters the brain. Interestingly, the ability to take in and process visual information efficiently seems to be on the decline, despite our ever-increasing visual and technological world. The National PTA estimates that 1 in 4 children under the age of 10 have a visual processing problem. 66% of illiterate adults test positive for a visual processing deficit. For the incarcerated, this percentage jumps to over 70%. There are many reasons for visual processing problems but it is important to note that the foundation of vision development is 3-dimensional movement and sensory integration. Over the last thirty years the way we play, work, and move has utterly changed. Recent generations are far more likely to sit and receive information through a 2-dimensional platform. This corresponds to a decline in literacy and increase in the dropout rate.

Experience Sensory Integration

A custom URL has been set up to allow you to view a two-minute segment from an online course on Vision and the Brain. This segment contains an experiment designed to integrate your visual and auditory systems.

Once at the URL you will discover a streaming media player with a brief video clip. You will need high speed Internet and the ability to hear audio on your computer. **Be sure to open and close your eyes every 2-3 repetitions as instructed.** We will share our experiences with this experiment in the upcoming discussion.

Go to:

<http://content.bitsontherun.com/previews/cKMgZFqZ-9F7JOGyC>,

or this alternate site; <http://in2in.org/insights/March2011OD.html>

Brain Development and Education

According to the article, “White Matter,” published in the March, 2008 edition of Scientific American (<http://www.scientificamerican.com/article.cfm?id=white-matter-matters>);

“Modern investigation has revealed that nerve impulses race down axons on the order of 100 times faster than when they are coated with myelin and that myelin is laid on axons somewhat like electrical tape, wrapped up to 150 times between every node. The substance is manufactured in sheets by two types of glial cells.”

“The frontal lobes are the last places where myelination occurs. These regions are responsible for higher-level reasoning, planning and judgment – skills that only come with experience.”

This last part relates directly to how we educate our students, what our future workforce looks like, and the value of experience. The article goes on to explain that myelin forms by doing. Learning a complex skill – complexity involves multiple senses simultaneously engaged and increasingly pushed to higher performance levels - creates noticeable changes in white matter. And, “A higher development of white matter correlates directly with higher IQ.”

Over and over again research confirms that movement boosts brainpower. In the recent bestseller “Brain Rules (http://www.amazon.com/Brain-Rules-Principles-Surviving-Thriving/dp/0979777747/ref=sr_1_1?ie=UTF8&qid=1300363852&sr=8-1-spell),” author John J. Medina lists movement as the number one rule for brain development. This is because foundational skills, from visual processing to the critical vestibular-visual connection, are developed through 3-dimensional movement, sensory integration, and bi-hemispheric integration. The inability to multi-task or simultaneously use multiple sensory systems has symptoms that mimic other problems, from ADHD to cognitive fatigue, ocular-motor difficulty, and physical/motor challenges. All of this impacts not just whether or not an individual can perform, but critically, how fast they can perform. More and more curricula are being moved online. New software and technologies are being added to all levels of education, which is exciting and certainly will generate a new kind of neural development. But spending the bulk of our time sedentary in front of a pulsating light source also has real physiological consequences that should be understood and mitigated, and not just for those who are struggling or have attention difficulties. These processing problems can be common in the gifted, simply because they do gravitate to early reading and heavy use of technology.

For more than a decade there has been a push for school reform, resulting in numerous and diverse new methods of achieving literacy and stemming the dropout rate. Yet nearly

40% of our fourth graders are functionally illiterate and our drop-out rate is as high as 50% in some urban areas. Without passing judgment on one reform program or another it can be stated that the reduction or complete removal of music, art, 3-dimensional games in class, and physical education has been broad-based over the last thirty years. It is now standard for schools to require that children read before the end of Kindergarten and there is a panic if they aren't reading well by the end of first grade. In several Northern European countries they do not begin to teach reading prior to six or seven years of age, as many optometrists contend that ocular-motor skills are not prepared to converge and track on a line of print at age 4 or 5. As we enter a new and exciting era of technology and the individual creativity and expression it will bring, it is important to simultaneously understand the basic biology of sensory development. We are human beings and thirty years of technology have not changed the way the brain learns to think.

Discussion Areas

Is there a "processing" gap between older and younger workers?

Do we consider how one co-worker may process information differently than another?

What is the outlook for our future workforce? What strengths and weaknesses do you see?

Are you spending more time and money on training now than twenty years ago?

What does your training look like? Is it multi-sensory?

Are you accounting for cognitive and ocular-motor fatigue created by the additional technology in the workplace?

How many of your employees or co-workers are utterly distracted by their child's difficulties in school?

If we do not figure out the best method to teach literacy and critical thinking will we instead import more labor and spend increasing billions on welfare and incarceration for the at-risk populations that drop out of school?

Biography

Leslie Peters has over 20 years experience as an author/producer, specializing in leading multi-disciplinary teams of subject matter experts and administrators in the creation of multi-tiered, multi-media educational programs. Her training programs have been used in over 800 schools and government agencies and garnered over 60 awards, including 2 Emmy awards and 30 Telly awards. Her educational broadcast programming has been seen and heard on public television and radio stations around the country. Ms. Peters has produced leadership and management training programs for a variety of organizations, from the Department of Justice to billion dollar corporations on the topics of crisis management, coaching, best practices, corporate change, and the psychology of retention. Each program is research-based and relies on extensive input from both experts and end-users. Most recently she authored the Vision and Learning professional development series, offered for continuing education units in partnership with several colleges and universities and online in a streaming media format at www.sensoryprocessingcourses.com