GATHERING DATA THROUGH ALL SENSES

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"Nothing reaches the intellect before making its appearance in the senses."

Latin proverb

Does this quotation shock you? Or should we say, shock your senses? Perhaps it is surprising to realize that your brain reduces the world to its elementary parts: photons of light, molecules of smell, sound waves, vibrations of touch first. These elementary parts send electrochemical signals to individual brain cells that store information about lines, movements, colors, smells and other sensory inputs. All external information gets into your brain through one of these sensory pathways:

- *gustatory;* The tastes you gather through your mouth.
- *olfactory,;* The smells you inhale through your nose.
- *tactile:* The sensations you feel through your skin.
- *kinesthetic:* The positions you take through your movements and posture.
- *auditory*: The sounds you hear through your ears.
- *visual :* The sights you see through your eyes..

And it is not the single input of any one of these but the interplay within and between all of these systems that is how your brain functions. When one of these pathways is either

blocked or compromised, the others are heightened so that you can make sense of the world.

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Most linguistic, cultural, and physical learning comes from the environment by observing or taking in through the senses. An apple, for instance, must be eaten to know its crispness and sweetness. To know a role in a play, it must be acted; to know the game of soccer, it must be played; to know a dance it must be moved; to know a goal it must be envisioned. We deepen our knowledge as we experience more in the world. Some students go through school and life oblivious to the textures, rhythms, patterns sounds and colors around them. Sometimes we are afraid to touch, get our hands "dirty" or feel some object might be "slimy" or "icky". When this happens, we are operating within a narrow range of sensory problem solving strategies wanting only to "describe it but not illustrate or act it", or "listen but not participate, to look but not to touch." Those whose sensory pathways are open, alert, and acute absorb more information from the environment than those whose pathways are withered, immune, and oblivious to sensory stimuli.

We gather data from internal sources as well. If you are in touch with your own emotions, you are also in touch with the physical sensations in your body. For example, you know that you are fearful because your heart rate begins to speed up, your stomach clenches, and your hair stands on end. You sense what other people are experiencing or feeling by sensations that arise in our own bodies. All of us are like walking antennae, receiving and registering the felt experience of those around us. Some of us are better at this than others. To accurately register this kind of information requires being in touch with our own emotional responses.

Both internal and external data gathering is a blend of automatic responses to stimuli and actions guided by our knowledge and expectations. As long as the sensory receptors (the eyes, the ears, the skin, etc.) are in good working order, they will automatically, unconsciously and simultaneously take in all the stimuli bombarding them at any given moment in time. However, we may not be consciously aware of all this information; much of it is determined to be irrelevant and is discarded. For example, some of the stimuli (such as the temperature in the environment or other peripheral data) are often encoded without conscious attention. It is only when the environmental conditions cause discomfort that we attune to what our senses are telling us.

Another aspect of brain function that helps us understand why multiple sensory input is important is that the brain does not store a memory in a specific location, rather it is stored all over the cortex in a sort of neural circuit; the sound in the auditory cortex, images in the visual cortex, etc. When you recall the memory, the brain reactivates or reconstructs the circuit in which it was stored. The more sensory modalities that were activated, the more triggers the brain has for reactivating the circuit. This suggests that concrete experiences you encounter that activate several of the senses can enhance your recall of the information at a later time.

Learning about the ways that your brain gathers and stores information can help as you are learning. Many people find attending to the arts and music improves their mental functioning. Forming mental images is important in mathematics and engineering; listening to classical music seems to improve spatial reasoning. Social scientists solve problems through scenarios and role-playing; scientists build models; engineers use cad-cam; mechanics learn through hands-on experimentation; artists experiment with colors

and textures. Musicians experiment by producing combinations of instrumental and vocal music. A skilled chef experiments with combinations of flavors and textures of various foods.

So remember the Latin proverb: "Nothing reaches the intellect before making its appearance in the senses" and learn to gather data through all of your senses to enrich your intellect!