

# The Bridging Times

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## Brain Neuroplasticity

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Brain Neuroplasticity refers to the ability of the brain to be changeable through interaction and experience with the environment over time.

The optimal learning brain is dependent on how well the two brain hemispheres communicate with each other. The hemisphere communicate through large cable connections made up of millions of nerve fibres called the corpus callosum (in addition to smaller cable connections known as the anterior commissure).

Many neural networks in the brain include region of both hemispheres. Furthermore, some higher cognitive functions do not lateralise to either hemisphere, and is particularly true of the frontal lobes, where most functions are bilateral. These include executive functions involved in planning, reasoning, judgement, impulse control, motor functions and memory. Therefore, the brain is functionally integrated and operates as a unified whole.

So while some specific functions do lateralise, meaning they are largely located in one hemisphere or the other, this is as far as the left-brain/right-brain popular hype should go. The false dichotomy of the "left-brain"/"right-brain" learner or personality, and how we process information is misleading pop-psychology exaggerated by advertising.

### Neurogenesis and Learning

The great news is that human intelligence is not fixed and we can intervene to enhance learning and human development because of Neurogenesis. This process by which neurons are generated for the growing brain is most active during pre-natal development and continues throughout adulthood.

It means newborn cells (not all) can become functionally integrated into the surrounding brain tissue to rewire the cable networks, to result in strengthened brain communication and cognition. Studies have shown that learning itself is associated with increased neuronal survival.

This white substance for connectivity is crucial for the grey matter to work well. While particular brain regions are important for specific functions, the brain operates as a highly-connected small-world network and not a collection of discrete regions. The neural networks connect one brain region to another intricately. The capacity, speed, efficiency and timing of information flow, within and between regions in the brain, determine optimal learning.

Based on this new frontier of advances and research,

it is clear that the whole spectrum of specialised intervention, clinical, therapeutic work and rehabilitative developments can change brain synapses, create new connections, and enhance not only performance but also the brain matter.

A growing number of institutions such as Feuerstein Institute and Bridge Learning are helping infants, children and adults overcome cognitive, emotional, psychological, and social difficulties and disabilities, reach their latent potential, and achieve what was once thought to be impossible.

### Applicable Implication No. 1

As opposed to the accepted assumption of "fixed and immutable intelligence", and those who swear by standardised IQ testing, cognition is indeed malleable. Surely and thankfully, the IQ score is not an indicator of future performance.

Human beings of any age, culture, or economic conditions have an inherent and unpredictable propensity to improve our cognitive abilities regardless of age, status, cultural background, or even developmental disabilities.

### Applicable Implication No. 2

So as you are faced with difficult problems, don't despair. The process of problem solving causes neurons to fire, stimulating the brain. Don't deprive your children from a good brain workout by offering solutions prematurely or doing their tasks for them, for instance, resolving conflicts at the playground.

### Applicable Implication No. 3

Early childhood development is of indisputable importance and intervention is proven to be most effective at an early age. However, there is no need to deprive a child of his childhood with "paranoia cramming" after hearing dubious theories suggesting that the brain cannot grow or learn efficiently after the first five years of life.

To prevent learning difficulties in later stages, here are some general tips for parents:

Guidelines By Age	Say No!	Say Yes!
Below 1	No Watching Television	Yes to lots of hugs, kisses, touches and hearty chats
Below 2	No Flashcard Drills No Multimedia Gadgets	Yes to varied range of sensory exploration and stimulation
Below 3	No Phonics' Drills No Spelling	Yes to psychomotor, balance, tumble and fall, sensory-motor integration and adaptive life skill activities

### Applicable implication No. 4

Are we preparing our children for just tests, school or life? Parents, educators and learning systems need to reform our modus operandi towards cognition and learning in order to better prepare the adults of tomorrow for the dynamically globalised world.

So while established systems such as academic subject-based drills and label/categorical-based intervention may or may not have served us well, and we may not understand the entire rocket science yet or ever (like in all other matters), it is detrimental to maintain status quo and resistance to new paradigm shifts.

We are innately capable of positive change and progress. "Do not conform to the pattern of this world, but be transformed by the renewing of your mind," simply states that our mind can certainly be rewired.