

Over the past decade, education neuroscientists, using fMRI's, have explored the brain's vast inner workings, researching the structural regions and neurological processes that facilitate knowledge acquisition and thinking for all learners. During typical brain development, neuro- networks are formed and organized into a framework for learning called "Brain Architecture." *Recent education-neuro studies illustrate that language development and processing is a key component to forming the brain's foundation for learning.* Although all brains are innately wired the same way for learning, specific external, nurturing activities by caring adults and informed teachers are required for learners to flourish. What does this mean? (1)

How do we develop brains for learning?

Brain architecture develop brains for learning use predictable interactions and input that is repetitive, intentional, explicit, direct, clear strategy "*Serve and Return*," first focus on vision and hearing then language and cognition.

How the brain develops:

One hundred million neurons develop per second in the brain. These neural connections form the brain's architecture or framework for learning.

Building a solid foundation for learning begins with developing language/s. Language is the key to learning, reading, and cognition. Neurologically, learners acquire language or multiple languages in exactly the same manner, regardless of their primary language or the number of languages spoken. To acquire, process, and effectively use languages for learning, reading, and comprehension, learners need extensive in-person, direct, and consistent 'speaking and listening' interaction with parents, caregivers, and teachers within a stable, emotionally supportive, predictable environment at home and in the community. (2)

HOW

"Serve and Return"

Dedicated language brain structures develop in the womb, the last 10 weeks of gestation.

Every infant hears the vocal sounds of their parents. Parents can talk to their unborn infant, read stories, and play music in multiple languages before birth. Once born, babies need face to face verbal interaction with adults.

A technique called, '*Serve and Return*' is initiated by infants when they 'serve' language through babbling, cooing, and gestures; and demand adults to 'return' the serve by responding to the sounds and actions of the baby.

Multilingual families foster dual language development in infants when each parent or adult responds, clearly and intentionally, in his or her respective language. A baby responds accurately to the specific language spoken by each adult, forming a dual language brain or 'bilingual brain map'. Learners acquiring two or more languages simultaneously, learn both equally. There is no delay in

learning either language when both are acquired at the same time. However, the infant-adult language interaction must be clear, predictable and repetitive. (3)

TEACHERS

Early Childhood and K-12

Classroom teachers continue '*Serve and Return*' by designing flexible, open classrooms and lesson plans which encourage quality verbal interactions or 'TALKING' with peers, student-to-teacher and other adults in multiple languages within multi-level, diverse language groupings.

Personalized, student-led learning opportunities encourage learners to make individualized instructional decisions, conduct research and share insights which foster, not only language development and comprehension, but enhance developing executive function skills, as well.

Students learn how to intentionally 'serve' or initiate content rich academic conversations, debates, discussions, speeches, and presentations in any language and 'own their learning'. Teachers respond by organizing and facilitating the learning using academic content, and interactive, multilanguage-level, multilingual instruction that is aligned with rigorous, grade-level academic and reciprocal language standards in the four linguistic domains.

Additionally, establishing highly interactive learning environments which integrate the five senses, plus: Movement, Human Connection, Touch, Social/Emotional and Physical engagement as an ACTIVE part of daily instruction, regardless of age, language, or grade-level increases cognition.

Students and teachers who interchangeably follow an "I DO, WE DO, YOU DO" approach to teaching and learning solidify the learning process.

BRAIN BASED DUAL LANGUAGE INSTRUCTION

TEACH LANGUAGE AND CONTENT SIMULTANEOUSLY

Teachers enhance dual language development by providing learners equal access to demanding academic concepts by integrating language or dual language instruction equal to grade-level academic content derived from rigorous academic and language standards.

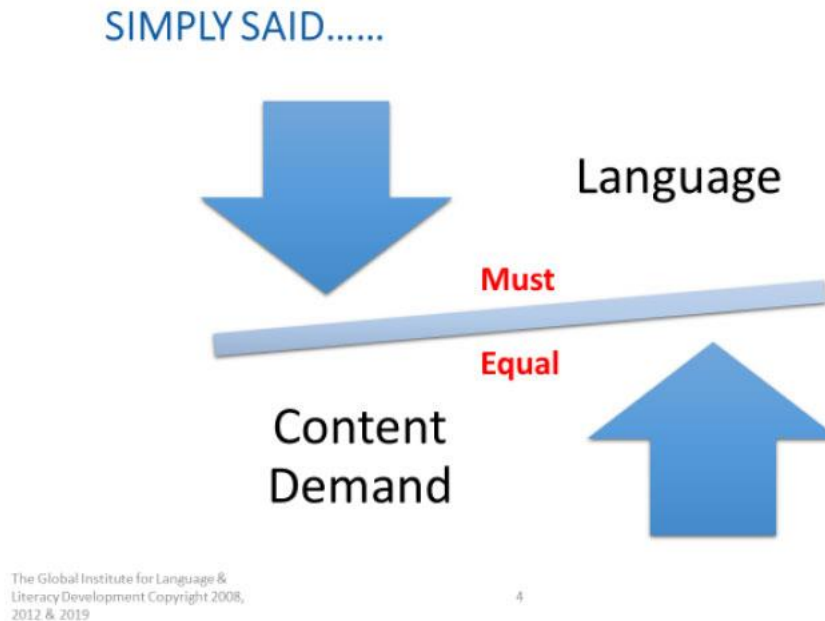
HOW

Analyze the concepts in the academic content standards. Ask, what am I required to teach?

Ask, what aspects of language must be taught at each language proficiency level in each linguistic domain that matches the language demand present within the academic concept?

Choose instructional strategies that develop language in reading, writing, speaking, and listening that provide access to the concepts in the academic content at each grade-level.

Organize your instruction to balance both language/s and content in each lesson.



BE INTENTIONAL, CLEAR, EXPLICIT, and PREDICTABLE

Developing brains for learning is a complicated process. Yet, there is a plethora of empirical scientific evidence that helps inform instructional decisions applicable to every learner worldwide. The universality of brain development allows all students to reach their highest intellectual potential when educators reimagine and reinvent education based on the newest neuroscience research available. Educators can and will ensure equal access to equal educational opportunities when we teach according to How the Brain Learns!

For more information contact:

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