Defining the Many Faces of Learning Disabilities: How language disabilities morph overtime.

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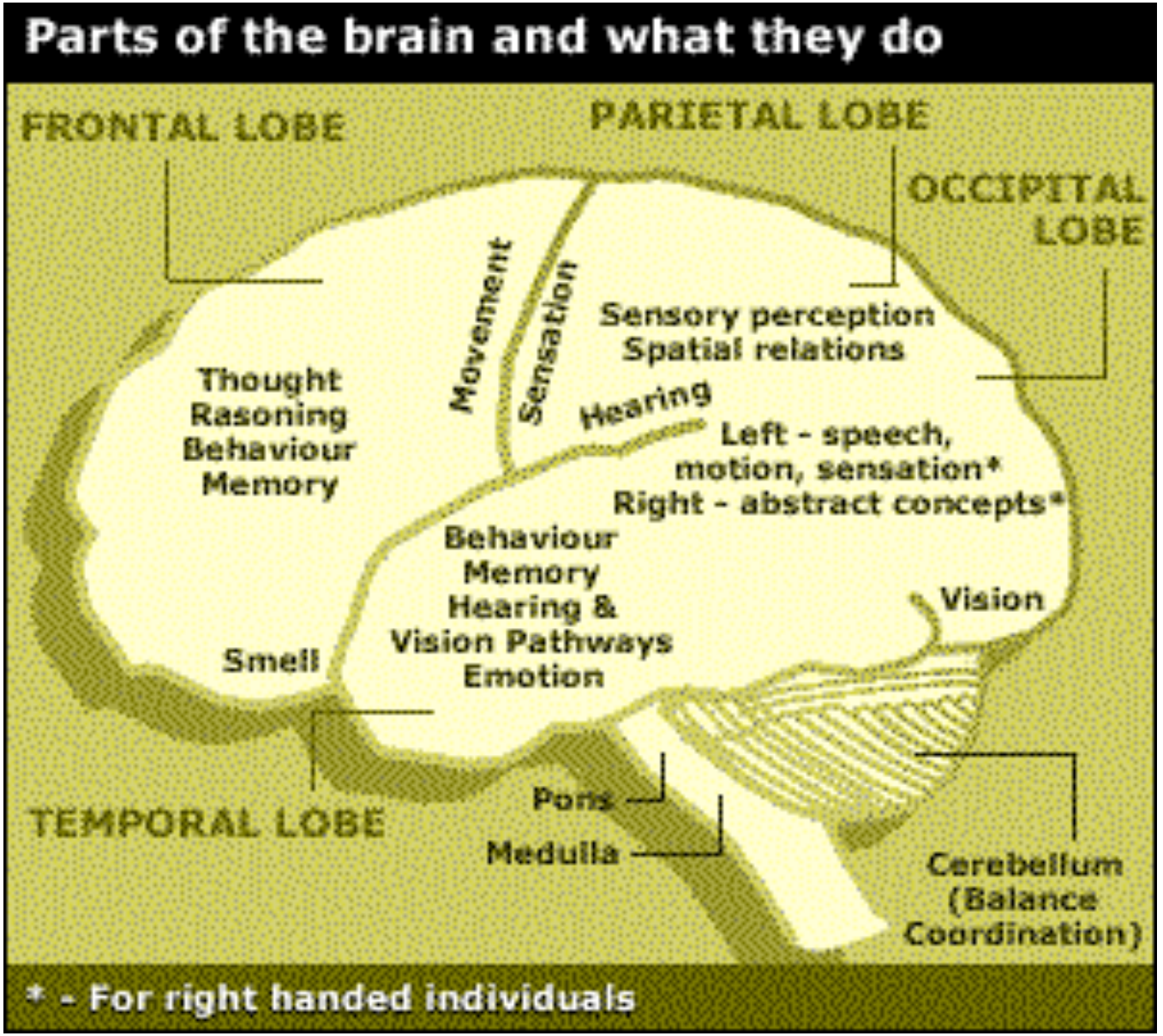

Parts of the brain and what they do
FRONTAL LOBE
PARIETAL LOBE
OCCIPITAL LOBE
Movement
Sensation
Sensory perception
Spatial relations
Thought
Rasoning
Behaviour
Memory
Hearing
Left - speech, motion, sensation*
Right - abstract concepts*
Behaviour
Memory
Hearing &
Vision Pathways
Emotion
Vision
Smell
TEMPORAL LOBE
Pons
Medulla
Cerebellum (Balance Coordination)
* - For right handed individuals

Wired To Talk

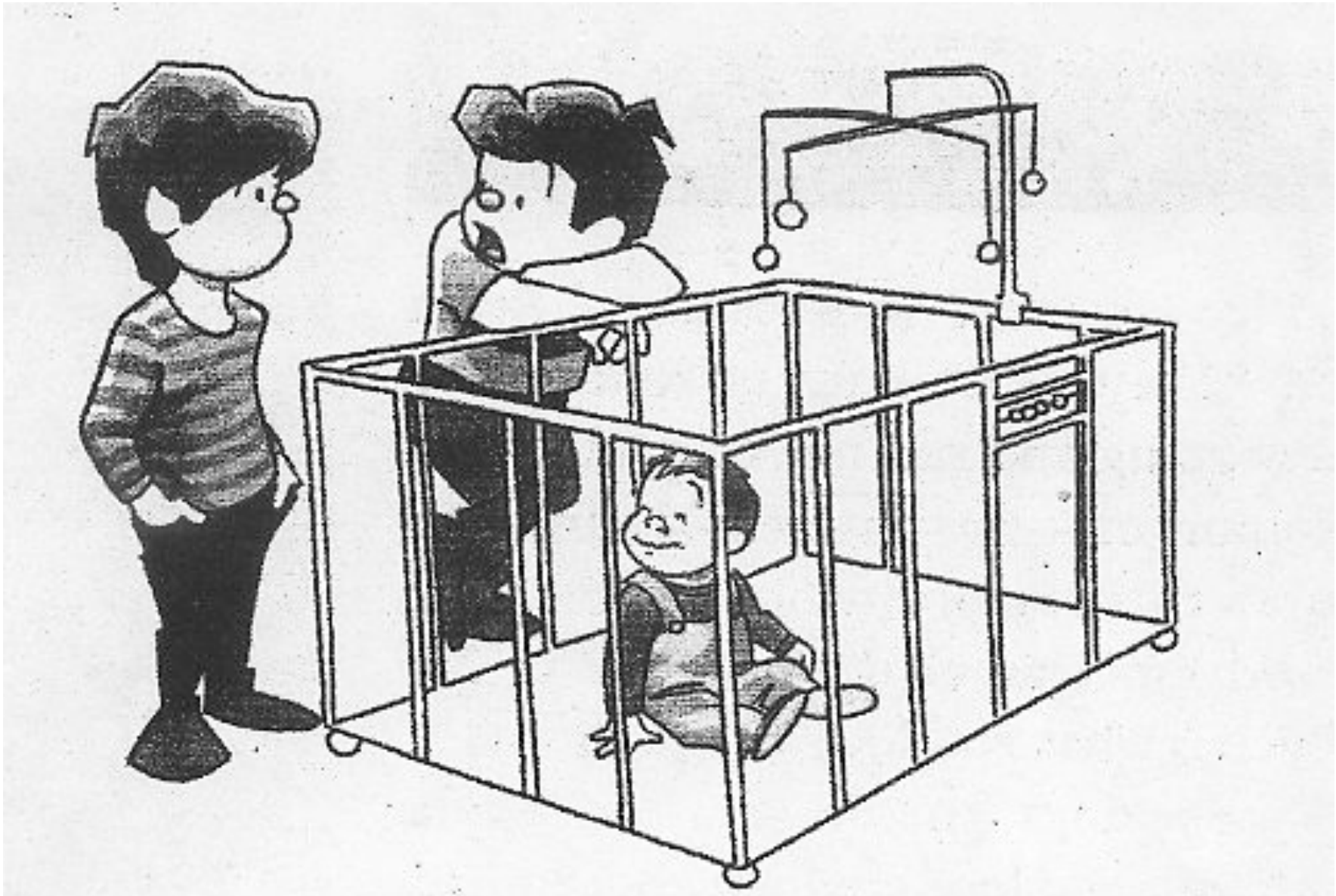
- Born with the innate capacity to acquire language
- Neurological differences between males and females by as early as 28 weeks gestational age
- Language universals are independent of culture
- Critically sensitive periods for different aspects of language
- Language plasticity and neurological growth

Language “plasticity”

- Semantic system (vocabulary) is life long.
  - on average 10 new words a day are added from age 1 to age 17 with decline in the curve around 10 years. (Welfare child by age 4 has 13 million fewer words of cumulative language experience)
- Grammar system:
  - by 3 years of age plasticity is already diminished, and is fixed by 4 – 6 years of age
- Phonology system:
  - tight early critical period for some aspects like accent (birth to 9 months). Word segmenting and phonological awareness see drop off by age 5

Brain Sculpting

- The brain is very much influenced by what we CAN DO
- The opportunity for children to build skill upon an already previously acquired and MASTERED skill is critical
- “Readiness”, must take into consideration neuro-development and when the individual child is “ready”, not the curriculum



"I have a bad feeling about this...He used his first words to tell on me."

How critical is early language experience for learning?

- The most important difference among families was in the ***amount of talking***
- *Average welfare child had half as much language experience per hour, and less than one third of the language experience than the professional family.*
- *By age of 4 the average welfare family child has 13 million fewer word experience than professional family child*

“Boys and girls enter the classroom with different needs, different abilities and different goals”.

Differences start early

Males	Females
2x as many conceptions as births	25 % lower mortality rate
99% of speech comprehensible by 4yrs	99% of speech comprehensible by 3yrs
Play rough, competitive and aggressive	Play quieter more cooperative
Slower to acquire reading and writing skills	Reads better and sooner
More likely to ignore voices, even parents	Hears equally well with either ear

Neurodevelopmental readiness

- The assumption behind the “push” to teach reading and writing in Pre-K and K is that earlier exposure will guarantee improved performance.
- The assumption is valid only if what is taught is neurodevelopmentally appropriate.
- The neurodevelopmental timing and learning “receptiveness” will be different for boys and girls.

Neurodevelopment in Elementary Years

- Brain is becoming highly efficient at skilled practiced tasks that changes the primary “integration” cortex in the parietal lobe.
- Reading and writing are “overlaid” functions that use the hard wired linguistic/phonological machinery
- Motor improvement in distal muscles
- Improved attention

Neurodevelopment in secondary years

- With basic skill efficiency neocortex is “available” for higher level conceptualization
- Hormonal changes signaled neurologically are resulting in change physically and brain changes to the frontal lobes
- Improved metacognition including planning, initiation, organization and attention. (Metacognitive development and improved executive functioning continues into 3rd decade)

What are the risk factors??

- Reading failure?
- Language processing difficulty?
- Written expression?

What is a Learning Disability?

- What we call it or how we define it determines how we deal with the child
- LD's are ***dynamic*** not ***static***, just as learning is dynamic. (The effect of the environment and neurobiology changes the wiring.)
- Initial diagnosis is often by teachers, parents or the child. Experts help to define the strengths and weaknesses.

Neurological risk factors

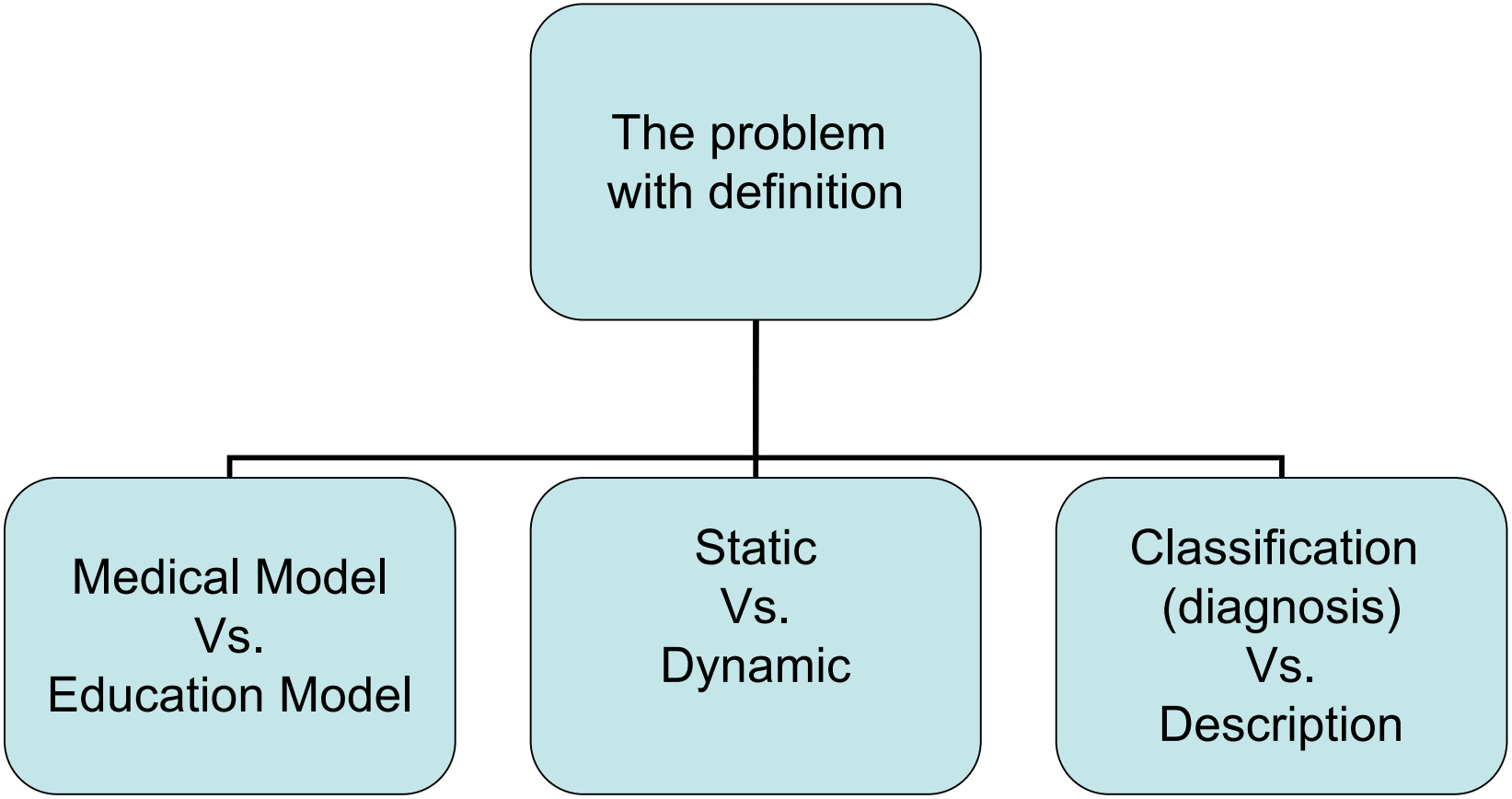
- 40% of children with delayed speech and language onset are at risk for reading failure or associated learning disabilities

- 40% genetic predisposition for dyslexia

The National Council on Exceptional Children: LD Definition

A child with a learning disability is one with adequate mental abilities, sensory processes and emotional stability, who has a limited number of specific deficits in perceptive, integrative, or expressive processes which severely impair learning efficiency.

Defining Learning Disabilities



The NCEC definition of Learning Disabilities includes these characteristics

- Hyperactivity
- Short attention span
- Impulsivity
- Perceptual deficits
- Memory deficits
- Language Deficits
- Deficits in reading, writing, math or spelling

Classroom “signs” of a reading disability:

- Trouble with alphabetic learning; connecting sound to print; rhyming
- Difficulty remembering the letter names or “hearing” the sounds
- Difficulty with sound sequencing or sequencing in general
- Difficulty with any ideographic learning, such as number names; confuses math symbols
- Difficulty with spelling
- Difficulty understanding what they read

At-Risk behavioral manifestations for reading disability

- Deficits in phonological awareness
- Deficits in phonological sequencing (transpositions)
- Deficits in immediate or short term auditory memory
- Deficits in word or phoneme retrieval
- Genetic history
- Delayed onset of speech and language

The longer a child remains a poor reader the harder it is to catch up

- Lack of reading practice
- Lack of varied reading
- Limited reading of classroom material and learning
- Loss of interest in reading and learning
- Compromises fluency
- Compromises growth of vocabulary and general knowledge
- Compromises growth of essential information
- Compromises school success

Classroom signs of a language disability:

- Limited vocabulary and difficulty with word retrieval
- Difficulty understanding humor, jokes and making inferences
- Difficulty following directions
- Difficulty organizing spoken (or written) language
- Difficulty retelling an orally read story

Language Processing Deficits (versus auditory processing- CAPD)

- Definition: **Language Processing** refers to the brain's ability to interpret and use information it hears.
- This is a complicated process that involves more than just "listening." It involves higher order language learning, including attention, memory, synthesizing, word knowledge.
- It is a deficit in processing the information in audible signals (sounds), that is not due to a hearing acuity deficit.
- Language processing difficulty can result from one or more deficits in the ability to **analyze, synthesize, organize, store, retrieve**, **attend to** and **use** information presented auditorily.

Classroom symptoms of language (and/or auditory) processing deficits

- Difficulty paying attention to and remember information presented orally
- Difficulty following multi-step directions
- Poor listening skills
- Poor eye contact and pragmatic language skills (especially in preschool children)
- Slow processing speed
- Compromised academic performance (can be in reading, spelling, writing and math)
- Difficulty with learning vocabulary and syntax
- Frequent need to reread to aid comprehension
- Increased anxiety

TO DO LIST FOR LANGUAGE/AUDITORY PROCESSING DISORDER
Preschool and early elementary:

1. Simplify language and present information slowly
2. Pair auditory information with gesture, pictures, objects or other visual information
3. Encourage eye contact and language reciprocity
4. Teach “wh” questions (“what, who, where” and the “why, how come, when”
5. Improve semantic knowledge by teaching word attributes and synonyms
6. Develop categorizing skills, including likenesses and differences develop story telling and story sequencing skills.
7. Directly teach math vocabulary including temporal- spatial concepts.
8. Restate more complex information and repeat shorter, but memory dependent directions.
9. Tell child to “turn their ears on” when it is important to listen.
10. Minimize background noise.
11. Encourage listening activities.
12. Use barrier games and other board games that encourage language reciprocity.
13. Emphasize the “syntactic glue” that strings high content words together.
14. Computer programs like Earobics (level1 and 2)

S.P.E.E.CH (for CAPD/Language processing disorders)

S = State the topic to be discussed

P = Pace your conversation with pauses for comprehension

E = Enunciate clearly

E = Enthusiastically communicate using gestures and appropriate body language

CH = Check comprehension before changing topics

Expressive language disorders

- ***Expressive language disorders can have many different behavioral manifestations because expressive language has many different components.***

  1.speech articulation (can effect spelling and phonics)

  2.vocabulary knowledge and retrieval

  3. language sequencing, usage and knowledge of grammar

  4.organization of thought

  5.sociolinguistic and pragmatic skills

Strategies

- Semantics- Word Learning:
  - teach new words in the context of something familiar
    - use a word multiple times in many ways
    - use a word in different grammatical context
- Grammatical Learning:
  - highlight endings and root words, emphasize superlative and comparative
    - find words within words
    - play with the grammar
- Phonological Learning:
  - segmenting sentences and words
  - discriminating and producing rhyming patterns
  - deleting and blending sounds

Learning to write requires systematic instruction

- Mapping sound to print and spoken word to printed word i.e., learning the alphabet and learning to spell
- Understanding sentence construction
- Understanding orthographic rules and conventions (punctuation, format etc.)
- Understanding paragraph construction
- Understanding the purpose of writing

Metacognitive skills critical to academic success

- Initiation
- Working memory
- Perspective
- Organizational skills
- Logic and sequencing skills
- Ideation
- Monitoring and evaluation