

LEARNING STYLES

Information Processing and Learning

Processing information and learning are affected by:

- internal circumstances - **inherited**, medical, physical, neurological, cognitive
- external circumstances - **home**, culture, communities, experiences
- personal circumstances - **temperament**, impulse control, attention, behaviour, self-concept, motivation

Contemporary research supports the **necessary integration and interdependence** of the collection of internal, external and personal circumstances required for children to **successfully construct meaning, learn and achieve** within their various communities.

PROCESS OF LEARNING

1. **attending** to, receiving, organising and storing information from the physical world,
2. **remembering** stored information as required, and
3. **responding**

PROCESS

- 1) **Input** of information.
 - We receive information through our motor, visual and auditory senses.
 - Information is gained from external and internal sources.
 - **Receptive language** can be in the form of oral, written or manual language such as facial expression, body language or gestures.
- 2) **Organisation** of information
 - Once we have received the information we need to cognitively **arrange it** and store it so that it is available for retrieval when needed.
 - We call this process of conceptualising, sorting, categorising and synthesising – **cognition or reasoning**.
 - The sequenced levels of understanding for reasoning are:
 - a) **concrete** - sensory-motor input with hands–or real life experience and direct observation / 3D

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- b) **representation** - pictures and recordings which reflect real life / 2D
 - c) **symbolic** - an abstraction of real life, e.g. using words, reading and writing
 - d) **mental operations** - visualising / imagining, when real life can be recalled and grouped without the aid of external cues
 - e) **regrouping or reconceptualising** - analysing feedback to reorganise understandings as required
- 3) **Output** of information
- The responses we make can involve **visual motor and/or auditory motor** integration eg taking dictation.
 - Response language can be in the form of **oral, written or manual language** such as facial expressions, body language or gestures.
 - Making appropriate responses across different contexts (such as the various uses of vocabulary in different subjects and cultures) requires the learner to be able to **independently generalise, transfer and adapt** the use of abilities and skills.

ABILITIES and SKILLS

1. **using** motor, visual, auditory and personal / social abilities to process information,
2. **integrate** skills, and
3. **respond** appropriately

1) **MOTOR ABILITY**

- a) Motor planning - **takes place before action**, consciously imitating, imagining, remembering and **sequencing** the performance of a motor task until the action is **secure in long term memory** when movement patterns are integrated and automatic at the independent level of function eg. tying shoes, riding a bike, writing your name, speaking.
- b) Body awareness - **position in space** (direction eg. up/down/between); laterality (left/right); **position in time** (motion / speed); inner sense of muscle and joint movement and position; **rhythm**.
- c) **ALL** motor acts involve

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- i) *patterning* - **ability to preform an action by imitation**, or with the help of visual and/or auditory or physical cuing such as learning a new dance routine.
- ii) *sequencing* - ability to perform **actions in combination with other actions** necessary to successfully complete a task; motor integration, such as repeating pre-planned sport plays.
- iii) *memory* - ability to **independently and consistently perform actions** without cuing / without having to think 'how-to', such as handwriting

2) VISUAL ABILITY

a) Perception / discrimination

- i) focus; **maintain gaze**; visual tracking in all directions
- ii) **similarities and differences** between physical attributes e.g., shape, size, a lower case 'd' is only a 'd' if the straight part is on the right & the round part is on the left
- iii) **accurate identification and comparison** of things seen despite visual background, size, or placement in space (the affect of conflicting visual stimuli), such as ignoring visual distractions while copying from the board.

b) Sequence / memory

- i) **gaining meaning** from specific ordering and reordering of things seen e.g., spelling, reading words or music notes, numbers
- ii) **accurate and consistent short term and long term recall** of the specific visual attributes of individual or patterns of things seen including shapes and symbols

c) Visual motor integration

- i) **following** written and graphic **directions**
- ii) eye hand / foot **co-ordination**
- iii) writing, drawing, crafts, playing the piano by reading the music notes, typing

3) AUDITORY ABILITY

a) Perception / discrimination

- i) hearing and locating the **direction of sound**; tracking sound
- ii) learning the similarities and differences **between sound attributes** e.g., volume / tone / pitch of the voice, rhythm and duration of sound. This includes the skills necessary for working with sounds in words.
- iii) accurate identification and comparison of sound(s) **despite background noise** and direction - the affect of conflicting auditory stimuli e.g. ignoring auditory distractions while listening to the teacher.

b) Sequence / memory

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- i) gaining meaning from a **specific ordering** and reordering of sounds e.g., in words, music, a bird's song
- ii) accurate and consistent short term and long term recall of the **specific auditory attributes** of individual or pattern of sound(s)
- c) **Auditory motor integration**
 - i) following **oral directions**
 - ii) speech with **accurate and clear** sound production - articulation
 - iii) singing; playing the piano 'by ear'

PERSONAL/SOCIAL: achieving **successfully** as an individual and as a member of various communities

1) **Personal Development**

- a) **work habits** - attending, working independently, completing tasks, taking direction, taking initiative, organising
- b) **emotional development** - impulse control, self-regulation, accepting responsibility, accepting criticism, adapting, empathy, degree of resilience

2) **Social Development**

- a) **contributing to a group** e.g., listen while others are talking & play by the rules
- b) **accepting** & understanding diversity
- c) **functional understanding** and use of expected behaviours and language

COMMUNICATION and COGNITION

1. **using** all forms of language as a tool to receive, compare, evaluate, and
2. **integrate** new and mentally stored information to
3. **expressively convey** meaning, at each level of understanding

Visualising

A common comprehension problem for some students with Specific Learning Difficulties is their **lack of ability to visualise and to sequence events in time**

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Visualising is the mental operation of **recalling real life without the aid of external cues**.

Visualising **requires skill** in recalling motor, visual and auditory information gained through the senses, including gesture, body language and facial expression.

A student who has a problem visualising may have difficulty:

- achieving the **Mathematics** Stage 2 outcome “Makes, compares, describes and names three-dimensional objects...and represents them in drawings”
- **gaining meaning when reading a [complex] sentence** such as, “the teacher stood beside Robert with her hands on her hips and eyebrows drawn together”.

Sequencing events in time requires visualising skills plus temporal understanding of concepts such as before, after, first, second, last, between - *an understanding that comes from information that can not be seen*.

This point is emphasised in Early Stage 1 time measurement outcomes in the new K-6 Mathematics Syllabus; although not in connection with SLD. Some students, especially those with SLD, do not gain a **functional understanding of temporal concepts** at this foundation level.

Students with SLD **tend to be very literal**. They do not generalise and transfer information well, especially from one context or subject area to another.

They **may require practice with hands-on real life experience and direct observation** coupled with corresponding language to cognitively learn how to organise, retrieve and regroup information to improve comprehension. For example, in Maths older SLD students learn to visualise more effectively using concrete materials.

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