Professional Development Webinar

(Term 2, 2016)

WORKING MEMORY

What you need to know

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WORKING MEMORY

What you need to know

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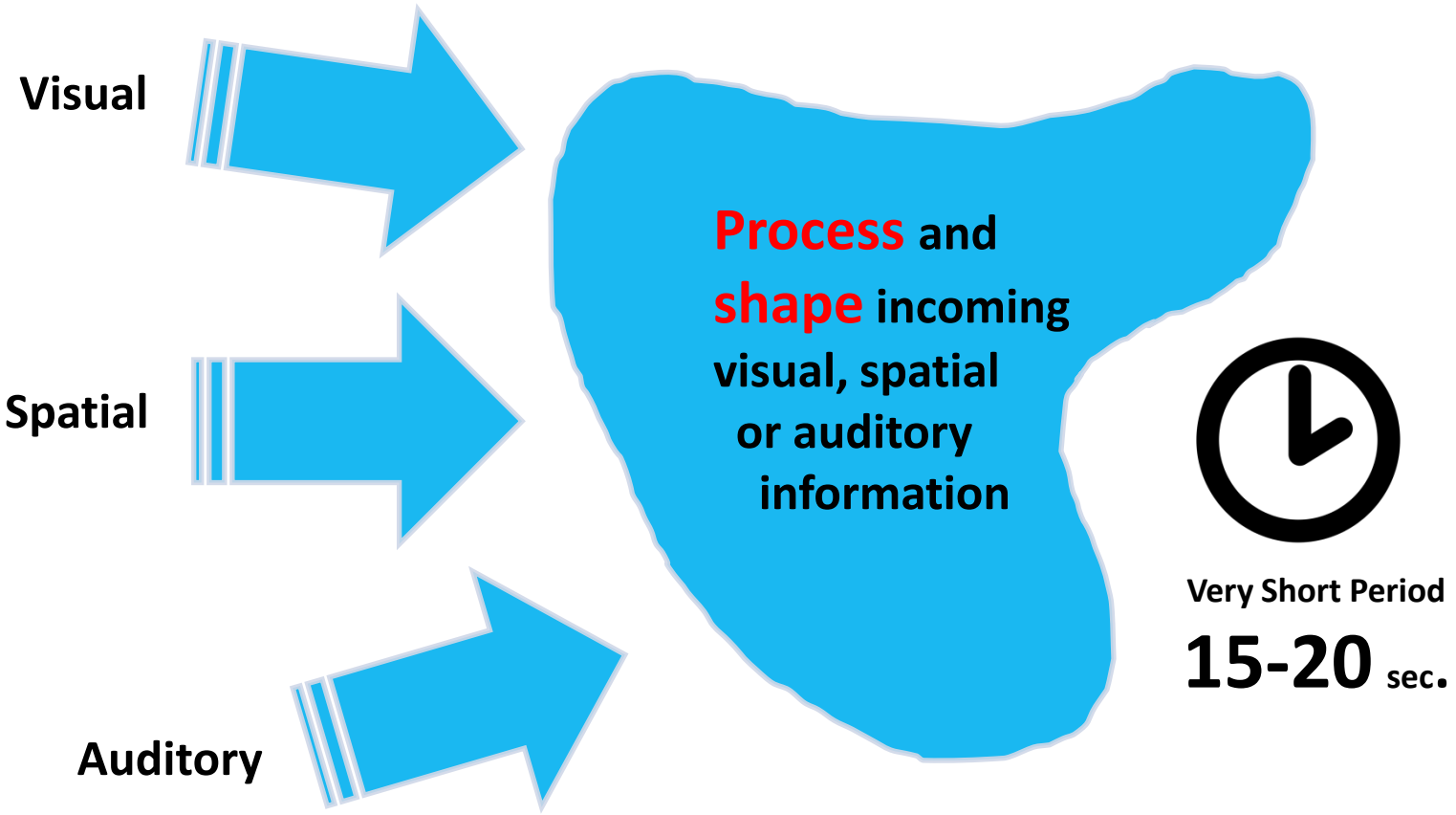
Working Memory

Concepts and definitions



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Working Memory

Concepts and definitions

Processing Speed

Concentration ability

Visual

Spatial

Auditory

Process and **shape** incoming visual, spatial or auditory information

Very Short Period

15-20 sec.

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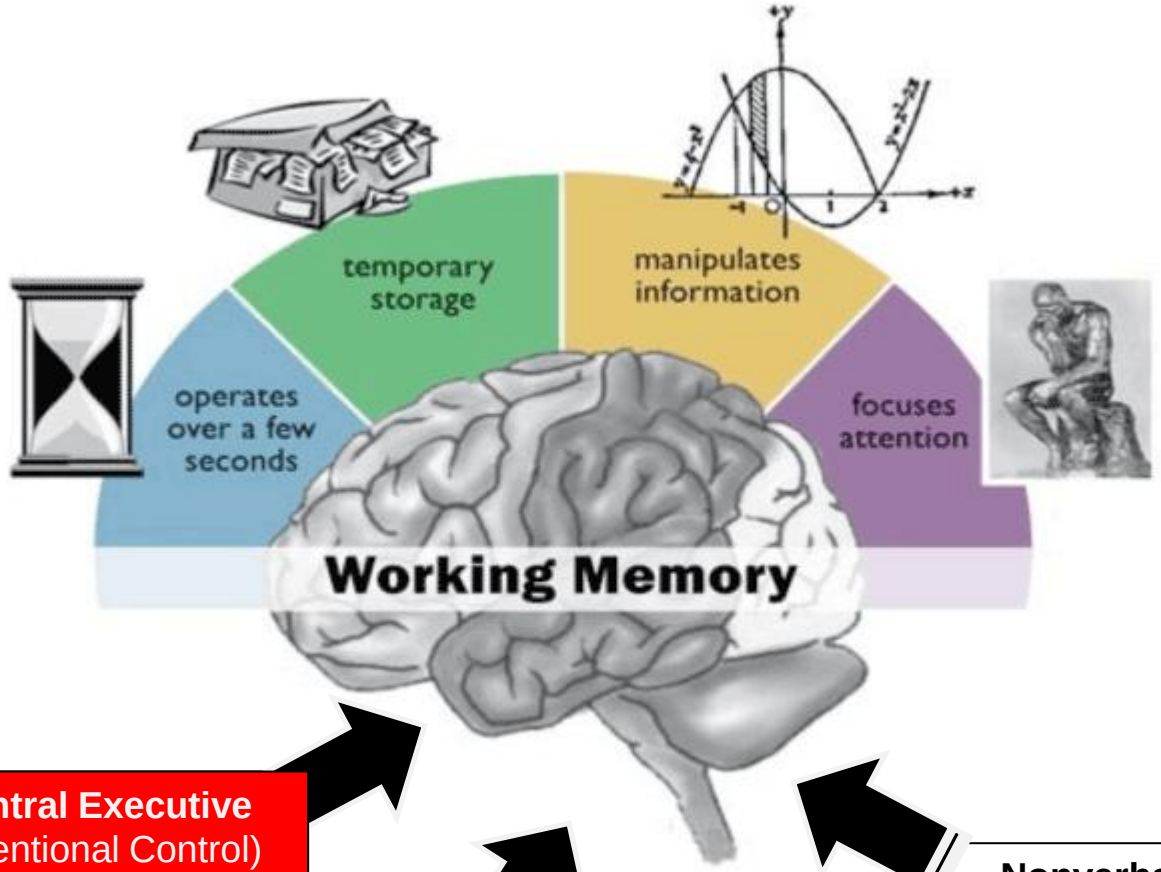
Working Memory

Concepts and definitions



Central Executive
(Attentional Control)

Verbal
(Auditory)
working memory

Nonverbal
(Visual-spatial)
working memory

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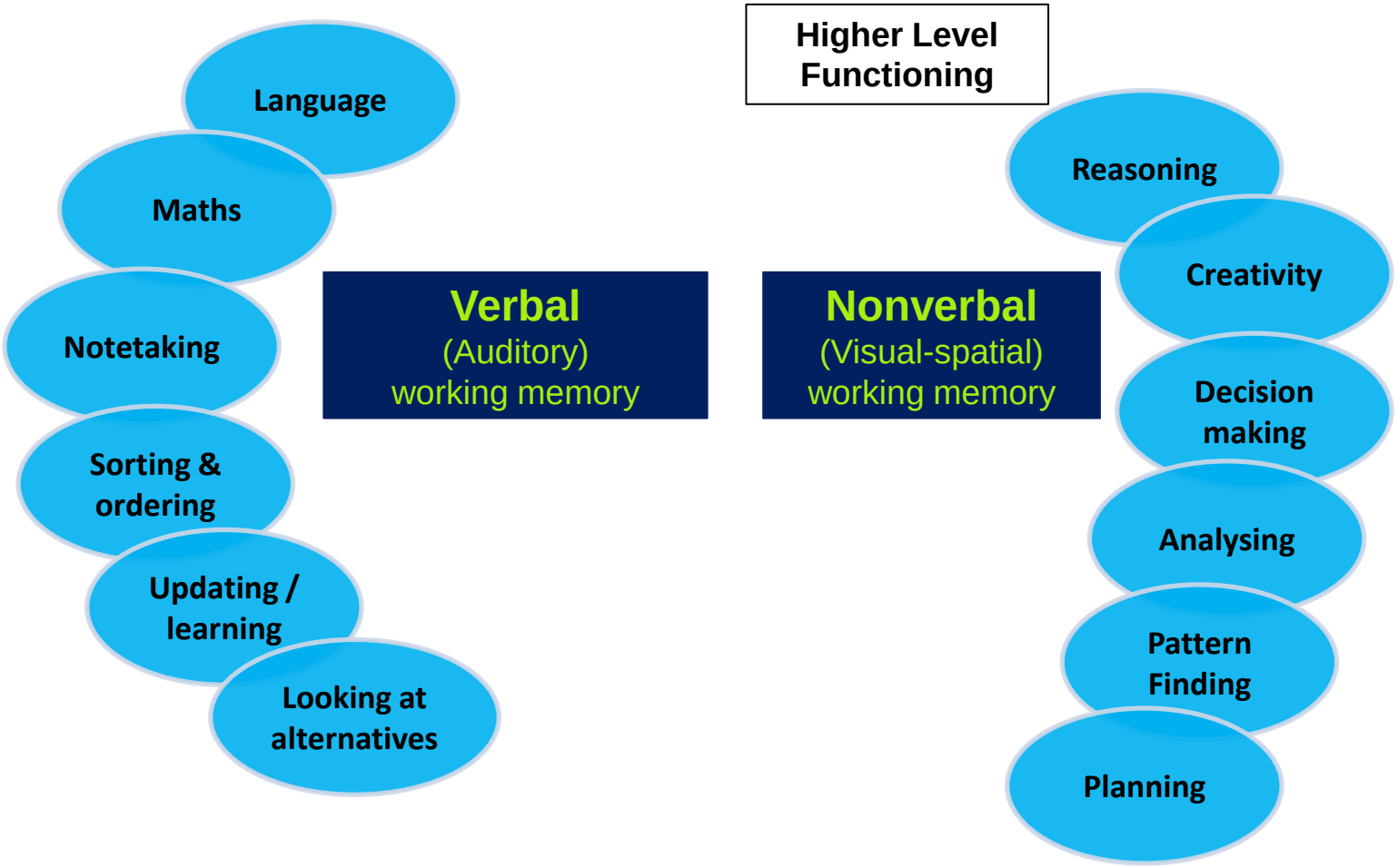
Working Memory

Concepts and definitions



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Working Memory

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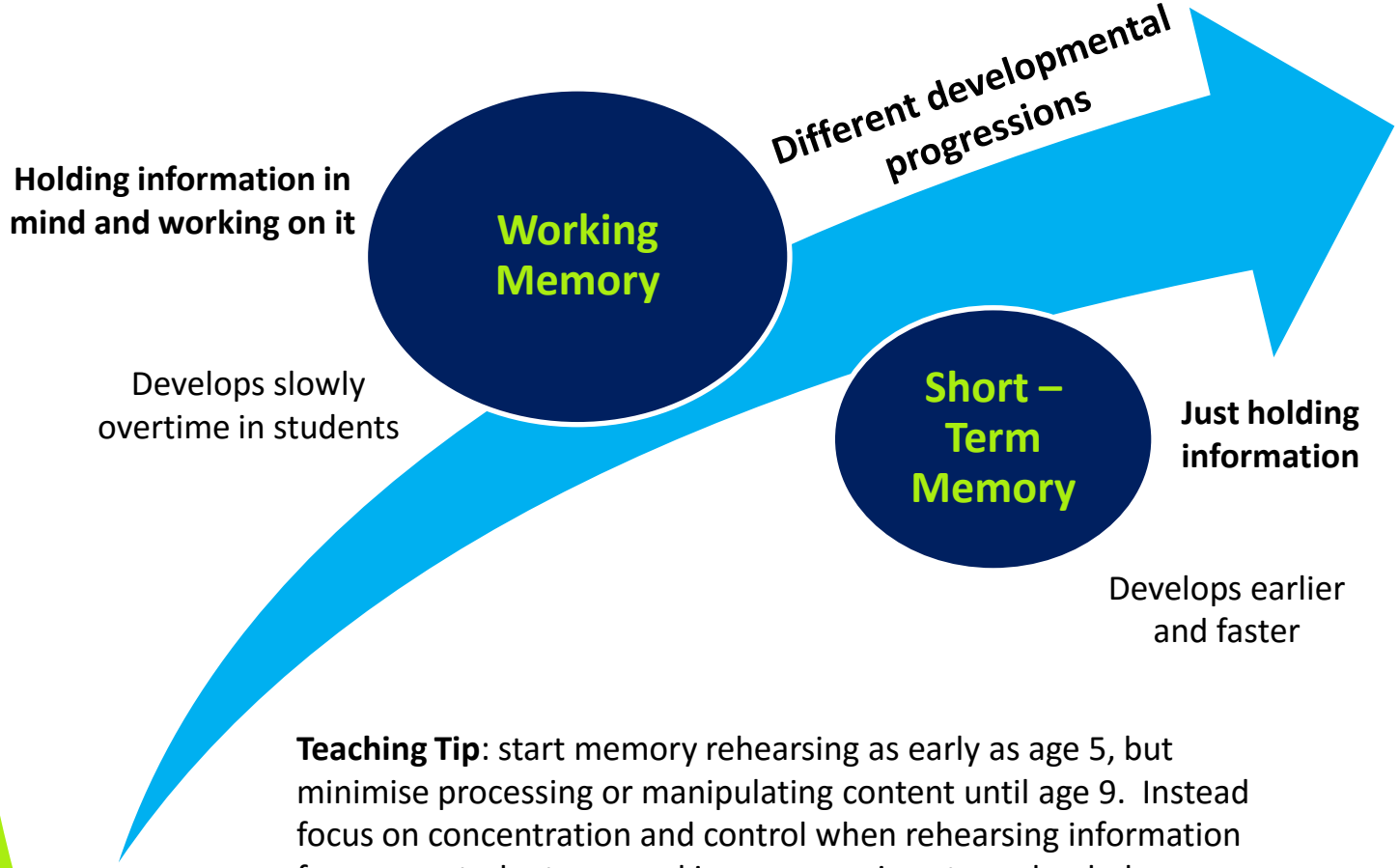

Teaching Tip: start memory rehearsing as early as age 5, but minimise processing or manipulating content until age 9. Instead focus on concentration and control when rehearsing information for young students so working memory is not overloaded.

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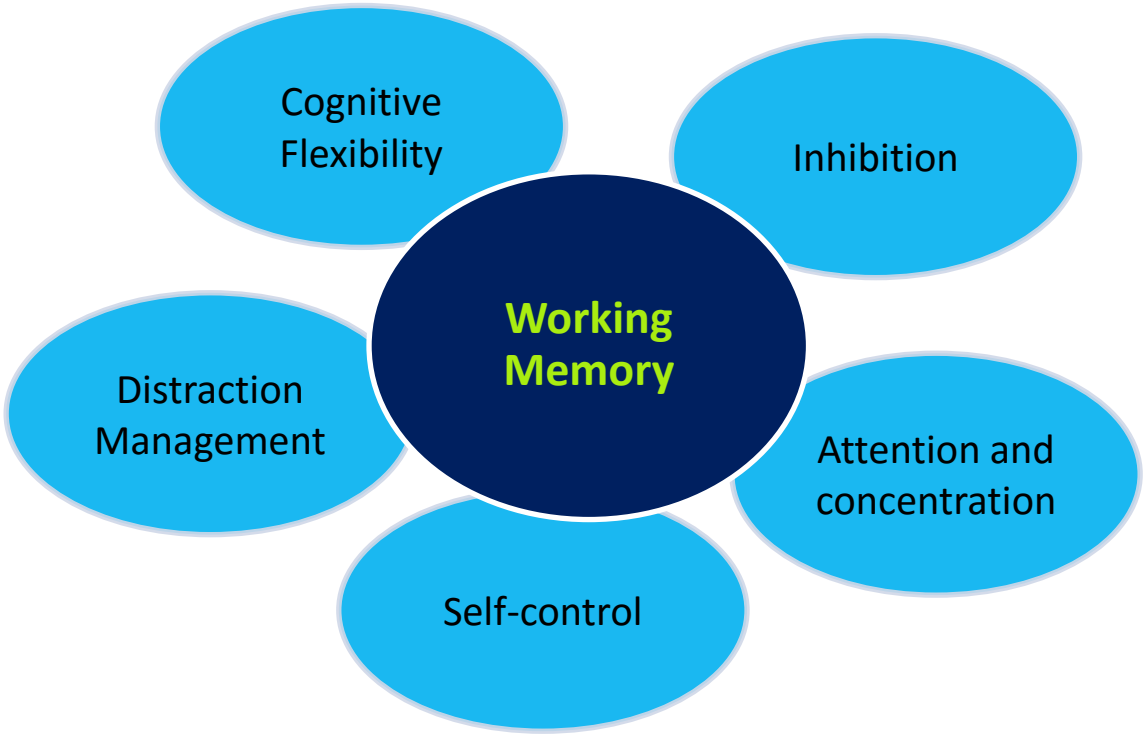
Working Memory

Concepts and definitions



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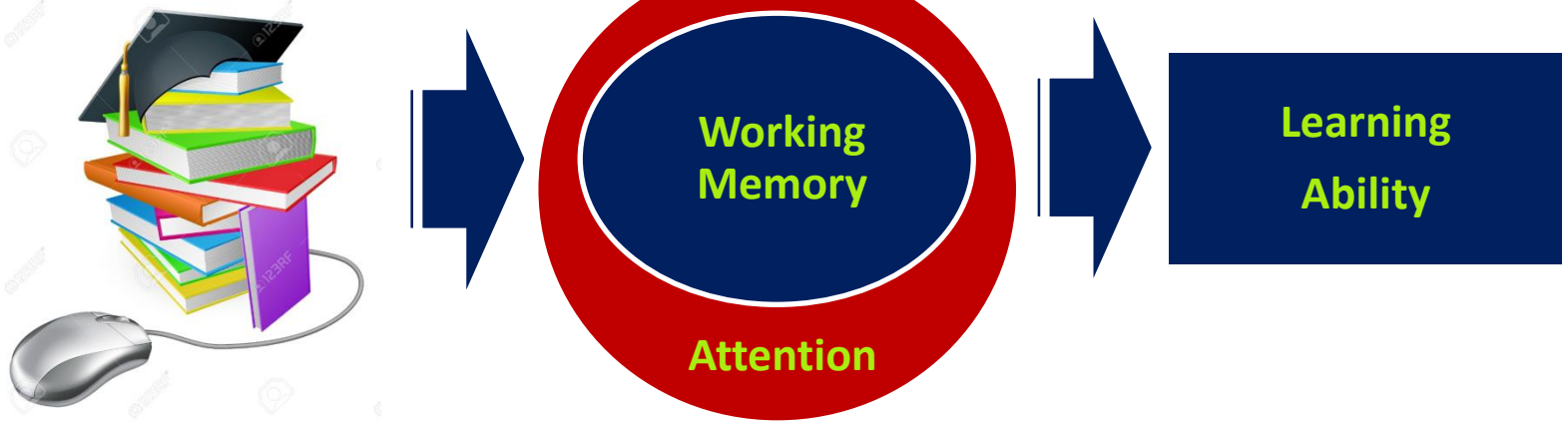
Working Memory Importance

Relationship to learning, intelligence and Life

Working Memory
Manipulation of information,
Interaction with long-term memory
Simultaneous storage and processing of information



Attention (and control over attention)
Particularly selective attention
Helps students to identify relevant information to load into memory, process it, and monitor it

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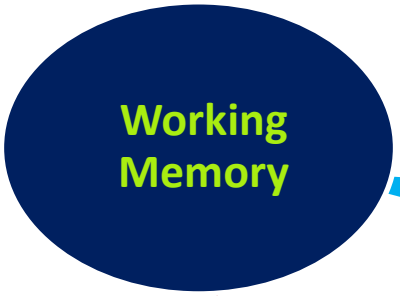
Working Memory Importance

Relationship to learning, intelligence and Life



30% to 90% of the variance in **academic** scores and **achievement** at school

HEAVY DEMANDS from classroom learning environment can overload working memory.

Learning **Reduced**, **s.l.o.w.e.d** or ~~stifled~~ when working memory overloaded.

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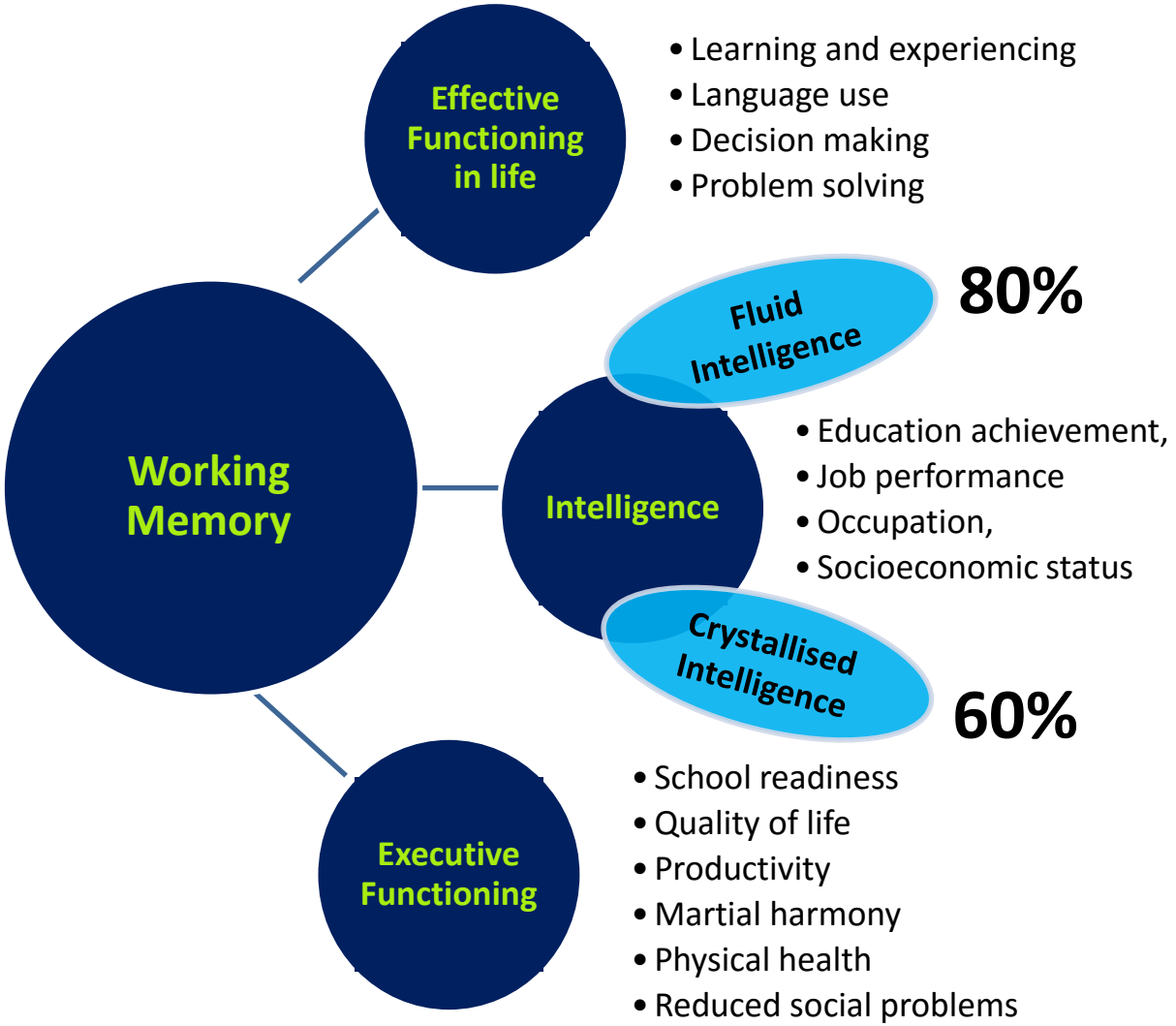
Working Memory Importance

Relationship to learning, intelligence and Life



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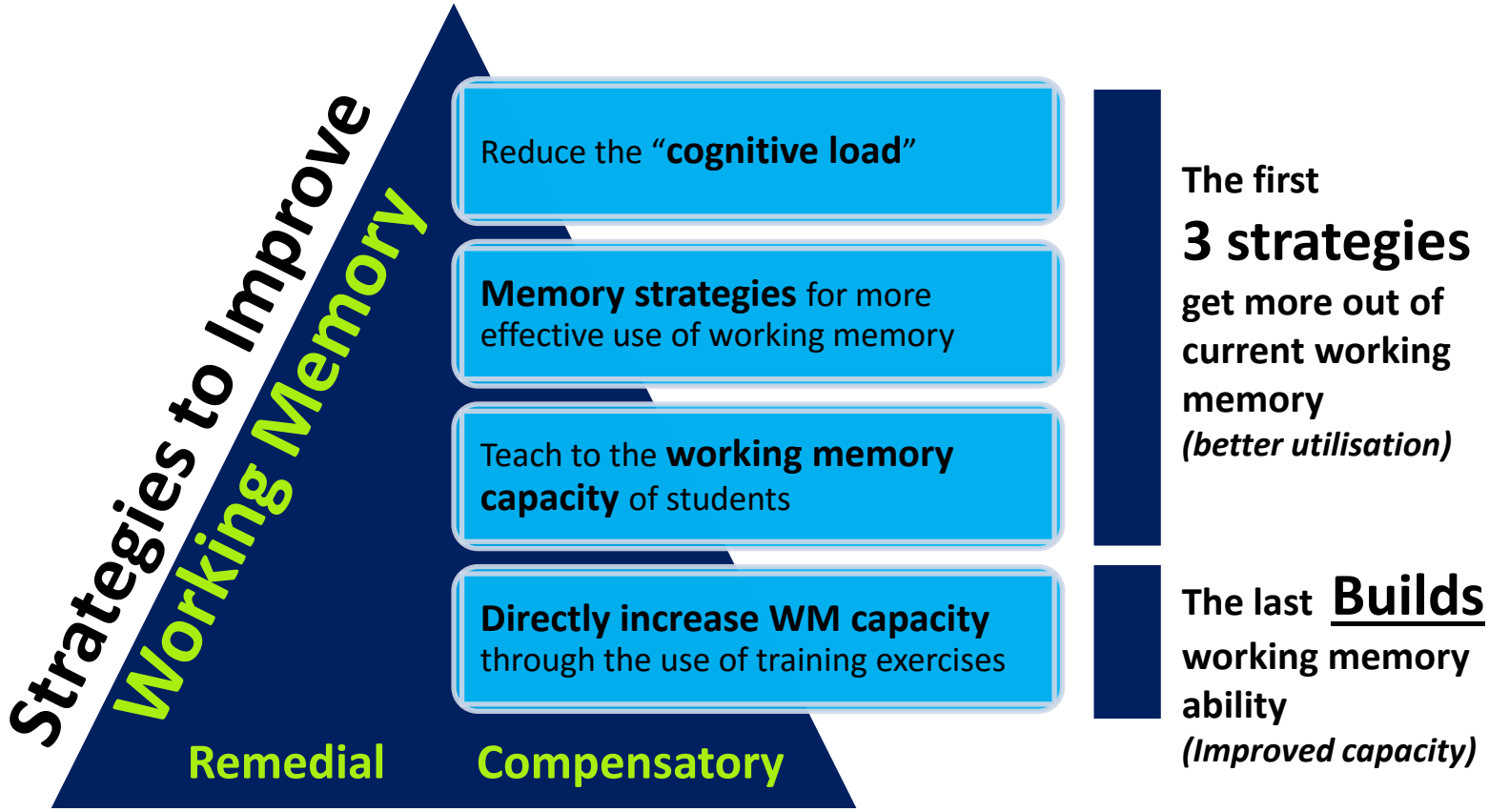
Working Memory Support

Ways to support, teach to, and develop working memory



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Working Memory Support

Ways to support, teach to, and develop working memory

Working Memory

- **Limited** and **disappears** quickly
- Storage and processing at **same** place
- Adults - memory span of about **7 items**, **4 chunks** of information.
- Children – as little as **1 chunk**
- Memory **span is reduced** when processing or manipulating many things at once.
- Without **rehearsal or processing** , information is gone within a few seconds (15 to 20 sec.)

Overload Factors

- Complexity or unfamiliarity
- Poorly organised materials
- Fast-paced instruction and insufficient consolidation time
- Excessive abstraction
- Too much verbal information
- Multi-tasking or rapid task switching
- Environments that are noisy, disorganised or cluttered
- Student's distracting thoughts

Teachers **need to be careful** to avoid overloading the working memory of students

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Working Memory Support

Ways to support, teach to, and develop working memory

Working Memory Strategies
(Helping students to better use their working memory to support learning)

Rehearsal Strategies

Rote strategies involve reproducing information in the same form in which it was encountered

Relational Strategies

Relational strategies involve transforming information through recoding, organizing, or reconstructing

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Working Memory Support

Ways to support, teach to, and develop working memory

Rehearsal Strategies

Rote strategies involve reproducing information in the same form in which it was encountered

- Sequential repetition
- Additive repetitive process
- Using voice aloud first, then whisper, then subvocal
- Encourage student say the words faster
- Increase length of list as student improves
- Use a variety of stimuli
- Using task switching processing and rehearsal

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Working Memory Support

Ways to support, teach to, and develop working memory

Relational Strategies

Relational strategies involve transforming information through recoding, organizing, or reconstructing

- Organisation and structure
- Meaning, relevance or purpose
- Using models, schemas, frameworks
- Mnemonics
- Imagery
- Story

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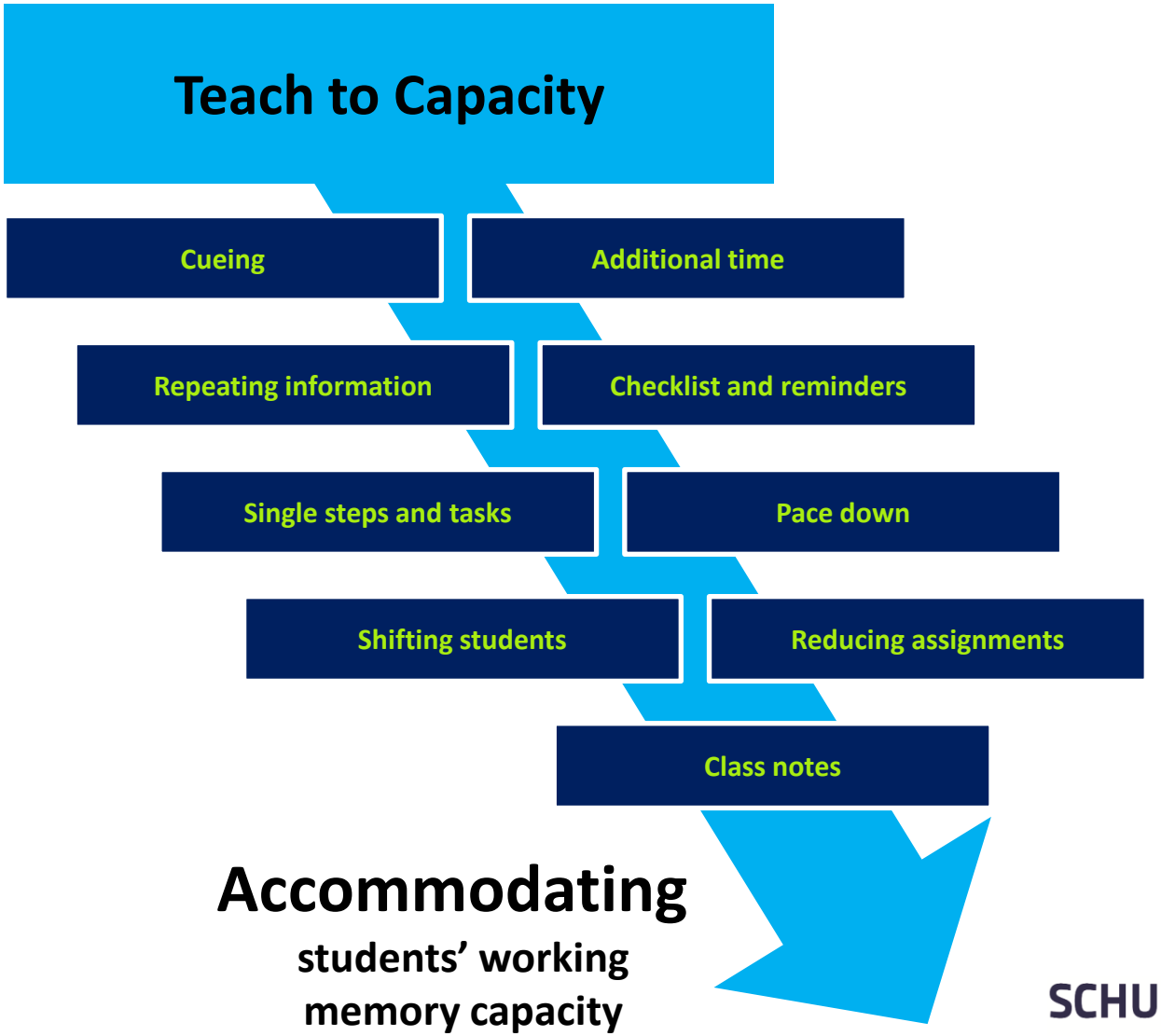
Ways to support, teach to, and develop working memory



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Working Memory Support

Ways to support, teach to, and develop working memory

Direct Working Memory Training

Build **or**

Rehabilitate

Working Memory Training

- **Exercises** and **Dedicated** programs
- NOT Strategies or Skills

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Working Memory Support

Ways to support, teach to, and develop working memory

Working Memory Training

Debate!

In Cognitive Psychology

Working Memory

IQ

STRONG CONNECTION

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Working Memory Support

Ways to support, teach to, and develop working memory

IQ

Increase IQ by training working memory

If successful…

Improve both working memory and IQ

Application

Cognitive impairments therapy

Improved cognitive functioning for all

In education, help students:
HIGH achievers and LOW achievers

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Working Memory Support

Ways to support, teach to, and develop working memory

Most of the popular commercial **cognitive training programs** are now taking much care to publish **up-to-date research** results, and to advertise only these benefits, that can be **scientifically justified**

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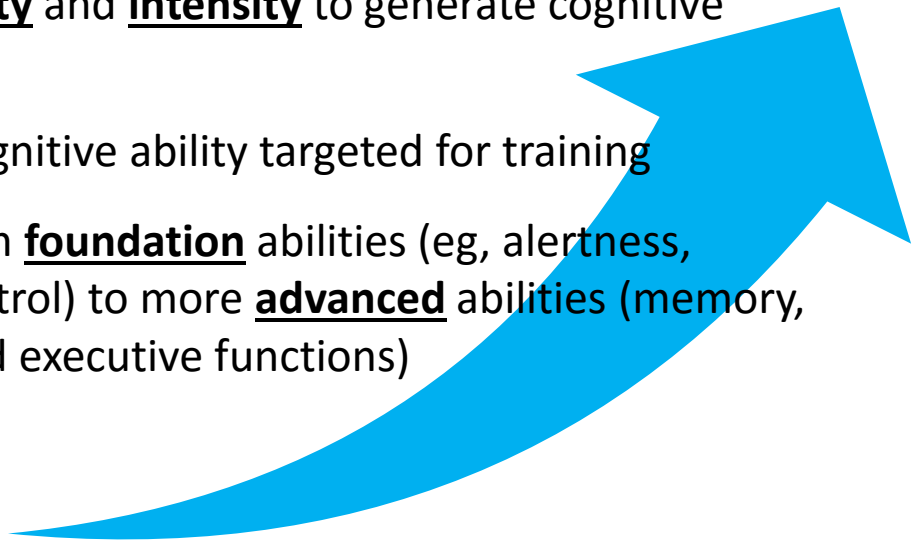
Working Memory Support

Ways to support, teach to, and develop working memory

To be successful, **effective** **cognitive training programs** that actually build working memory, processing speed, attention and executive functioning must:

- Have sufficient **difficulty** and **intensity** to generate cognitive change
- Engage the **specific** cognitive ability targeted for training
- Sequence training from **foundation** abilities (eg, alertness, attention, impulse control) to more **advanced** abilities (memory, complex attention, and executive functions)
- Be **repetitive**



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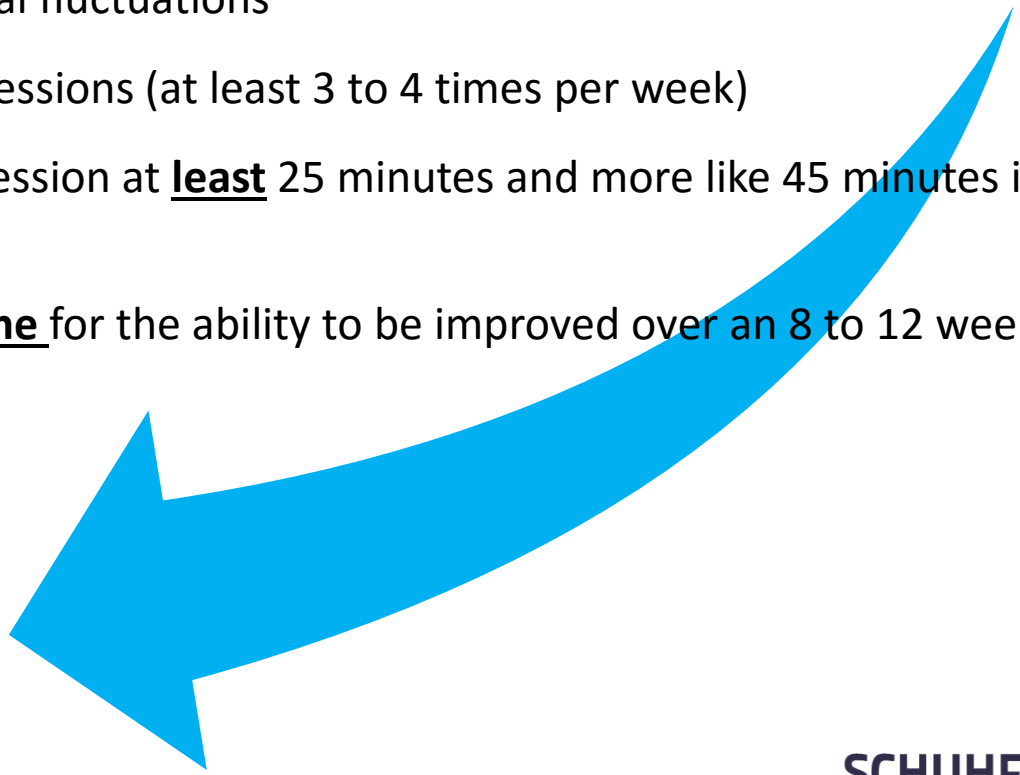
Working Memory Support

Ways to support, teach to, and develop working memory

Additionally, the programs must:

- Be **adaptive** to individual capacities of students and variations due to energy or emotional fluctuations
- Provide **frequent** sessions (at least 3 to 4 times per week)
- Ensure that each session at **least** 25 minutes and more like 45 minutes in duration
- Allow **sufficient time** for the ability to be improved over an 8 to 12 week period



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   - Professional Development
   - NEUROMITE programs
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3. Free Subscription

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   - School Resource Centre online
   - News updates (e.g. webinar invitations)

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