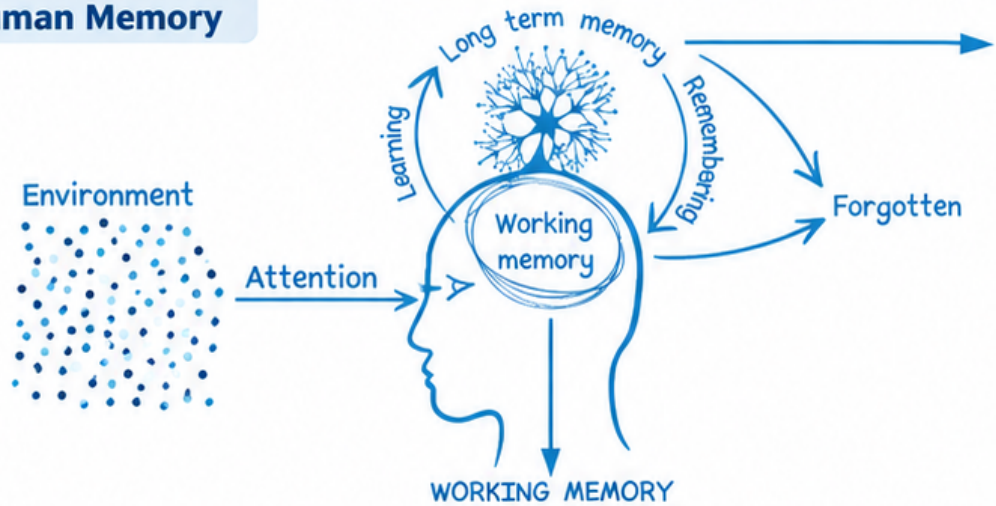
Learning in the Margins

Applying psychology to how children learn

Human Memory



LONG TERM MEMORY

- Has no contents limits (Passer et al, 2009)
- Information in our long term memory is stored as "schemas" which organise multiple elements of knowledge into single entities with a specific function (Paas & van Merriënboer, 2020)

Cognitive Load Theory (Sweller et al., 1998)

Intrinsic load: complexity of information to be learnt and how much the learner already knows about it.

Extraneous load: information attended to that uses up working memory space but is not relevant to the learning.

Germane load: supports the construction of schemas to aid retention of knowledge.

When there's more information to attend to than working memory has capacity for, there's a risk of information being misunderstood, misinterpreted or not being effectively encoded in long-term memory (Centre for Education Statistics and Evaluation, 2017). Teachers can use this knowledge to reduce extraneous load and make learning more effective.

Desirable Difficulties (Bjork & Bjork, 2011)

In order for schemas to be created, some level of challenge is required. Desirable Difficulties have been found to be important in creating the ideal learning environment. Four effective difficulties have been identified:

- Varying conditions of learning
- Interleaving
- Spacing learning
- Frequent formative assessment and feedback

Delivery applications

- Limited verbal instructions
- Chunking
- Worked examples
- Integrating information
- Guidance fading
- Frequent opportunities for information retrieval

Use these strategies as part of Plan, Do, Review and only add one at a time to understand effectiveness for individuals and whole classes. Consider vulnerable learners and those with additional needs, e.g. EAL, SEMH and neurodivergence.

Systemic applications

- **Spiral curriculum:** revisit the same topics but increase the complexity and depth with each encounter.
- **Consider the learning environment:** reduce visual clutter in classrooms and shared spaces whilst remaining welcoming. This is particularly relevant for neurodivergent learners.

Principles

1. Think about what you want young people to learn and consider ways to manage the extraneous load of instructions and learning environment.
2. Know your pupils and their levels of novice vs expertise in a subject so you can tailor the cognitive load to help them succeed.
3. Desirable difficulties are only desirable if they have a positive impact on learning.
4. Always consider the impact of a pupil's individual differences and life experience on their access to learning.

References

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