Attention and the Brain

- Emotions are now known to be a critical catalyst in the learning process. Emotions drive attention, attention focuses learning. Forgetting, we now realize, is not always a memory problem. It is often an *attention* problem and it is often an "*initial* attention" issue in the learning situation.

- It is biologically impossible to learn and remember information to which the brain has not paid any attention.

- The brain is not designed to remain attentive and focused on the same stimuli for extended periods of time (brain-antagonistic). Such circumstances yield diminishing returns over time ("over-fitting").

- The brain operates on alternating cycles of high attention and "downtime". During that downtime, the brain engages in processing, questioning, revising one's understanding, etc., in order to comprehend. "Concept consolidation" (1) varies from one individual to the next, (2) can range from almost instantaneous acquisition to a requirement of multiple concentrated efforts, and (3) the amount of time necessary for binding old knowledge with new information can extend from the immediate "ah-hah" experience to several days or more.

- The brain will interject its own downtime (in order to strengthen the new synaptic connections) whether you "schedule" the downtime or not (students "tune-out, process, record, and catch up"). Synapses can get stronger only when other neurostimuli are not competing with them for primary attention consideration ("cocktail party effect").

- Both new and complex concepts require more downtime than familiar concepts that are being revisited.

- Deep, long-lasting, in-depth learning requires the neuro-physiological formation of complex multi-layered neural networks.

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