Learning is a memory and retrieval process. It involves:

- attention,
- encoding information into short-term memory,
- consolidating and storing in long-term memory, and
- retrieval.

Memory does not store information like a file in a filing cabinet or a document on a computer, instead it recreates the memory every time. Thus retrieval, particularly in the beginning is an effortful activity. As that becomes practiced, the neural pathways become more efficient. Neurons that fire together, wire together.

There are many important elements to consider here. We’ll focus on three:

- fluency vs. mastery,
- desirable difficulties in learning
- distributed practice

Fluency is the recognition of ideas when they are presented to us. Because we recognize these ideas, we believe that we understand and can use them effectively. It is a shallow rooted memory process that does not require us to understand, to differentiate, and to be able to use the information; these abilities require mastery. In training, it is easy to ask for fluency when we do the talking. The effort expended in recalling the information and demonstrating its usage reflects whether the person has mastered the material and what areas still need attention.

This leads us to desirable difficulties. For learning to be effective it must work this memory process and in particular the retrieval process. Activities should be effortful, rather than effortless to cause the memory to be exercised and the neurons to fire together. Things that cause the learner to recalibrate, to differentiate, and to discriminate can help this process – within limits.

Finally, massed practice, despite our research to the contrary, does not accomplish the things noted in the prior elements as well as distributed practice does. Indeed, the research suggests learning is done best just as the person has begun to forget some of the elements.

Several strategies lead to better outcomes:

- low stakes testing – this can happen in a variety of forms
- interleaving – intermixing of practice tasks builds discrimination
- generative learning – asking people to use prior knowledge to build a mental model and/or attempt a new tasks
- interrogative elaboration – asking why something might be so
- reflection – asking people to reflect on practice or ideas.