Meaning → Learning → Performance

Peter Doolittle, Professor
Educational Psychology, Virginia Tech
pdoo@vt.edu * peterdoolittle.org

— For Instructors —

0. Introduction

1. Deep learning is fostered by students doing things and thinking about the things they are doing.

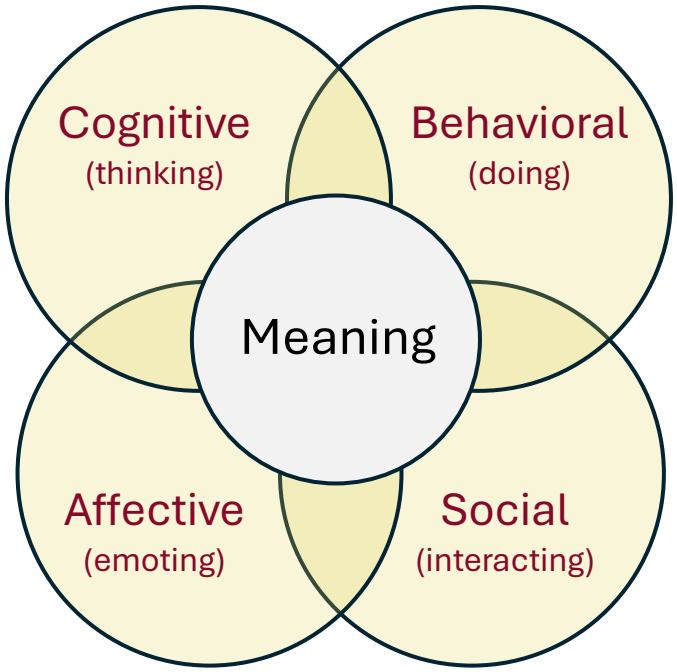
2. Deep learning-based experiences result in more student learning than lecture-based experiences.

3. Deep learning works best in formal (e.g., classes) vs. informal (e.g., LLC meetings) learning environments.

I. Meaning

a. What is meaning?

b. How do we create meaning?



IV. Theoretical Foundations for Creating Strong / Durable Knowledge

a. Processing-based Learning Strategies I: **Concepts and Schemas**

- **Retrieval Practice:** Learners tend to remember information better when they recall or retrieve information from memory, rather than simply rereading or reviewing the information.

- **Spacing Practice:** Learners tend to remember information better when they practice retrieving the information across multiple sessions, rather than massing practice in a single session.

- **Generative Practice:** Learners tend to remember information better when they construct meaning by connecting new and prior knowledge, rather than reviewing or repeating information verbatim.

- **Interleaving Practice:** Learners tend to remember information better when they alternate between topics under study, especially when they have similarities that might be confused, rather than focusing on one topic at a time.

b. Procedural-based Learning Strategies II: **Strategies and Procedures**

- **Steps:** Acquisition of step-by-step directions regarding how to complete the strategy or procedure.

- **Practice:** Repetition without goals, feedback, or intent to improve. Good for maintaining skills, but not improving them.

- **Purposeful Practice:** Goal directed and self-guided, with self-monitored feedback. Leads to better performance if one already has a good mental model.

- **Deliberate Practice:** Expert directed and guided, with expert feedback; Expert targeted practice on specific aspects. Essential for high level performances.

c. Pauses and Sleeps

- Purposeful Pauses

- Sleeping and Rest

Table 1. Levels of Procedural-based Learning Strategies

Practice Type	Definition	Goal Orientation	Feedback Structure	Cognitive Demand	Improvement Potential
Practice	Simple repetition without specific goals	None or vague	Minimal or absent	Low	Very limited
Purposeful Practice	Structured repetition with specific goals	Improvement	Self-monitored or intermittent	Moderate-High	Moderate; can plateau
Deliberate Practice	Expert-designed activities targeting specific weaknesses	Improvement of specific components	Immediate, specific, expert-provided	Very High	High; sustains improvement

Level 1: Practice
Repetition of an activity without specific improvement goals, attention to technique, or systematic feedback. The practitioner simply "does the thing" repeatedly. Improvement potential is very limited. Simple practice can maintain current skill levels but rarely produces improvement.

Level 2: Purposeful Practice
Structured practice with specific goals, focused attention, and self-monitored feedback, but without expert guidance on optimal practice design. Improvement potential is moderate. Purposeful practice can produce significant improvement because it involves goals, attention, and feedback; however, purposeful practice may focus on the wrong areas and fail to recognize subtle errors (based on the individual's lack of knowledge).

Level 3: Deliberate Practice
Practice activities specifically designed to improve performance, typically designed or guided by an expert (teacher, coach, mentor), with immediate feedback, targeting specific weaknesses, requiring full concentration. Improvement potential is high. Deliberate practice is the primary driver of expert performance development:

- Targets of practice are consciously selected (weaknesses to improve upon)
- Techniques for improvement are based on expert knowledge
- Feedback is immediate and specific, enabling rapid adjustment