How Learning Works Part II*

Skill Development/Mastery

To develop mastery, students must:

- Acquire component skills

- Practice integrating them

- Know when to apply what they have learned (transfer)

Methods to expose and reinforce component skills
- Push past your own expert blind spot
- Enlist a TA or Graduate student (someone with *conscious competence*) to help with task decomposition
- Talk to your colleagues, those outside your discipline, and search available educational materials to help decompose tasks
- Focus students' attention on key aspects of the task
- Diagnose weak or missing component skills
- Provide isolated practice of weak or missing skills

Methods to build fluency and facilitate integration
- Give students practice to increase speed and efficiency
- Allow students to practice one aspect of a skill

Methods to facilitate transfer
- Explicitly discuss when and where certain skills can be applied
- Give students opportunities to apply skills or knowledge in diverse contexts
- Ask students to generalize to larger principles
- Use comparisons to help students identify deep features
- Specify context and ask students to identify relevant skills or knowledge
- Specify skills or knowledge and ask students to identify contexts in which they apply
- Provide prompts to relevant knowledge

How Learning Works Part II*

Practice and Feedback

What kind of practice and feedback is important for learning?

Practice that is:
- Focused on a specific goal or criterion
- Targeted towards an appropriate level of challenge relative to student's current performance
- Of sufficient quantity and frequency to meet criteria

Coupled with feedback that is:
- Targeted, specific
- Timely
- Linked to further practice

Methods to address the need for goal-directed practice
- Conduct a prior knowledge assessment to target an appropriate challenge level
- Be explicit about your goals in your course materials
- Use a rubric to specify and communicate criteria
- Build in multiple opportunities for practice
- Build scaffolding into assignments
- Set expectations about practice
- Give examples or models of ideal performance
- Show students what you do not want
- Refine your goals and criteria as the course progresses

Methods to address the need for targeted feedback
- Look for patterns of errors in student work
- Prioritize your feedback
- Balance strengths and weaknesses in your feedback
- Design frequent opportunities to give feedback
- Provide feedback at the group level
- Incorporate peer feedback
- Require students to specific how they used feedback in subsequent work