Book Review: How Learning Works  
(from http://lesswrong.com/lw/jj2/book_review_how_learning_works/)

7. How Do Students Become Self-Directed Learners?
As one progresses in academic and professional life, one takes progressively more responsibility for one's own learning. The jump between high school and college can be especially jarring in this regard. **Metacognition**, "the process of reflecting on and directing one's own thinking," becomes increasingly important, but falls outside the scope of most instruction. Still, to effectively direct their own learning, students must learn and practice an array of metacognitive skills.

**Research:**

- One model represents metacognition as a continuously looping cycle of task assessment, evaluation of strengths and weaknesses, planning, execution and simultaneous monitoring, and reflection; all of these five steps are informed by a student's beliefs about intelligence and learning.

- Assessing the task is not always natural or obvious to students (essay prompts are often ignored; learning goals are not always clear).

- People are poor judges of their own knowledge and skills, tending to overestimate their abilities more the weaker they are.

- Novices spend little time in the planning phase of the cycle relative to experts in physics, math, and writing. Novice plans are often poorly matched to the task.

- Students who naturally and continuously monitor their performance and understanding learn better.

- Students can be taught to self-monitor, and this also improves learning.

- Monitoring alone is not sufficient; novice problem solvers will continue to use a strategy after it has failed (and certainly after it has proven modestly successful and familiar but not optimal).

- Students who believe their intelligence is malleable rather than fixed are more likely to learn and perform well.

- Moreover, the "malleable" perspective can be promoted by external influences, still leading to better performance.
Strategies:

- **Promote task assessment:**
  - Be more explicit about assignments than you think is necessary
  - Tell students what you do not want
  - Check students' understanding of the task in their own words
  - Provide a rubric

- **Promote self-evaluation:**
  - Give timely feedback
  - Provide opportunities for self-assessment.

- **Promote planning:**
  - Have students implement a plan you provide
  - Have students implement their own plan
  - Make planning the central goal of the assignment.

- **Promote self-monitoring:**
  - Provide simple heuristic questions for self-evaluation
  - Have students do guided self-assessments
  - Require students to reflect on and annotate their own work
  - Use peer review

- **Promote reflection and adjustment:**
  - Prompt students to reflect on their performance
  - Prompt students to analyze effectiveness of study skills
  - Present multiple strategies
  - Create assignments that focus on strategizing

- **Promote useful beliefs about intelligence and learning:**
  - Address these beliefs directly
  - Broaden students' understanding of learning
  - Help students set realistic expectations

- **Promote metacognition:**
  - Model your metacognitive process for your students
  - Scaffold students in their metacognitive processes