# CHAPTER 7: How Do Students Become Self-Directed Learners?

"Ambrose, Susan A.; Bridges, Michael W.; DiPietro, Michele; Lovett, Marsha C.; Norman, Marie K. (2010-04-16). How Learning Works: Seven Research-Based Principles for Smart Teaching (The Jossey-Bass Higher and Adult Education Series). Wiley Publishing."

**Principle**: To become self-directed learners, students must learn to assess the demands of the task, evaluate their own knowledge and skills, plan their approach, monitor their progress, and adjust their strategies as needed.

## Metacognition is defined as "cognition about cognition", or "knowing about knowing."

It can take many forms; it includes knowledge about **when and how to use particular strategies** for **learning** or for **problem solving**.

There are generally two components of metacognition:

1. Knowledge about cognition, and
2. Regulation of cognition.

## Cases:

- Melanie: all "A"s student in high school, started the night before, works best under pressure.
- John: Attends lecture, studies, highlights, memorizes, but no conceptual understanding.

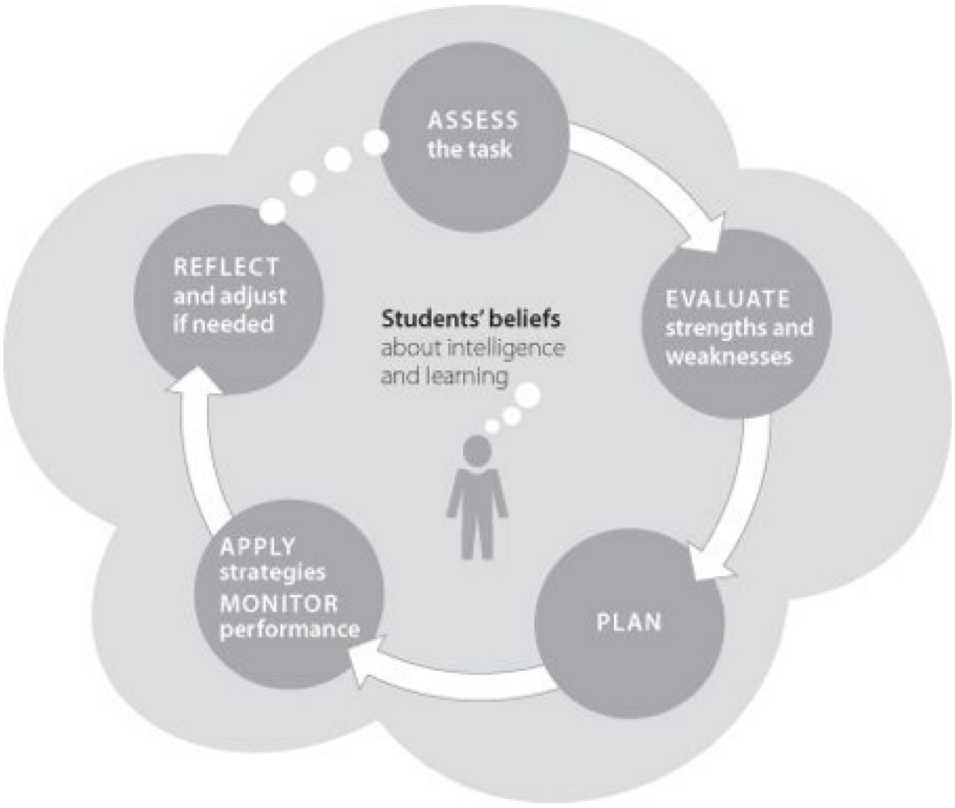
## What is going on in these stories?

- Both using strategies that worked in the past but not anymore.
- New intellectual challenges
- Don't develop new techniques

## What principle of learning is at work here?

- Metacognition: the process of reflecting on and directing one's own thinking
- Principle: Become self-directed learners by assessing the demands of the tasks, evaluate own knowledge and skills, monitor progress, adjust strategies
- Major challenge for college students: manage their own learning
- Metacognitive skills often neglected in instruction

## What does the research about metacognition tell us?




- Cycle
  - Assess the tasks at hand (goals, constraints)
  - Evaluate own knowledge (strength, weaknesses)
  - Plan (for current situation)
  - Apply strategies/monitor progress
  - Reflect (and adjust)

- Student's beliefs can affect the whole cycle

## Assessing the task at hand

- Study: Half of students ignored instructor's articulation, used generic "high-school" strategies.
- Not natural for students (examples of Melanie and John as they used "high-school" techniques)
- Students may need (1) learn how to assess the tasks (2) practice incorporating this step into their planning (3) receive feedback before start working

## Evaluate one's own strengths and weaknesses

- Difficult to recognize own strengths and weaknesses
- Studies: Usually students overestimate their abilities, especially weaker students.
- Inaccurate assessment affect the ability to finish the task on time and get the right resources

## Planning an appropriate approach

- Two big problems: (1) not planning enough {Melanie}, (2) planning inappropriately {John}
- Research: students spend too little time planning. Study of physics experts vs. novices, experts proportionately spent more time planning but got more accurate results, novices planned less and spent more time solving and got worse results.
- Research: When students do planning, plans often are not well matched to the task at hand.

## Applying strategies and monitoring performance

- Research: Students who self-monitor their own progress show greater learning gains

- Talk-aloud study: Good problems solvers continually stop reading to ask whether they were understanding.
- Research: shows that teaching students to self-monitor improves their learning.

## Reflecting on and adjusting one's approach

- Even with monitoring, students might not adjust their strategies: resistance, lack of alternatives.
- Research: Good problems solvers try new strategies when the current one is not working
- However these adjustments do not occur of the price is too high: time, effort, final results
- Busy and procrastinators will prefer a known moderately well strategy than a new best one.

## Beliefs about intelligence and learning

- Some beliefs: learning is fast & easy vs slow & hard, intelligence is fixed vs. malleable
- Research: Students who believe intelligence is fixed put no extra effort vs students who believe intelligence is incremental
- Belief in one's own ability in either direction can seriously impede metacognition (I'm great at this vs. I can't do math)
- Research: Belief are tough to change but a study showed it can be modified (letters to high school students after malleable/fixed intelligence sessions)

## What Strategies does the research suggest?

- Assessing the task at hand
    - Be more **explicit** than you may think is necessary
    - Tell students what you **do not** want (samples)
    - **Check** students' understanding of the task (ask, give feedback)
    - Provide performance criteria with the assignment (checklist, rubric)

- Evaluate one's own strengths and weaknesses
    - Give early, performance-based assessments (ample practice, timely feedback)
    - Provide opportunities for self-assessments (practice exams with key)
- Planning an appropriate approach
    - Have students implement a plan that you provide (interim deadlines, timeline)
    - Have students create their own plans (proposal, annotated bibliography, timeline)
    - Making planning the central goal of an assignment (plan a solution strategy)
- Applying strategies and monitoring performance
    - Provide simple heuristics for self-correction (reasonable answer?, how long should take)
    - Have students do guided self-assessments (exercises, share annotated samples)
    - Require students to reflect on and annotate their own work (explain what, why, how)
    - Use peer review/reader response (give students reviewers specific criteria)
- Reflecting on and adjusting one's approach
    - Provide activities that require students to reflect on their performances (questions)
    - Prompt students to analyze the effectiveness of their study skills (exam wrappers)
    - Present multiple strategies (art: public critiques, other: solve problems differently)
    - Create assignments that focus on strategizing rather than implementation
- Beliefs about intelligence and learning
    - Address students' beliefs about learning directly (practice, effort, adaptation)

    - Broaden students' understanding of learning (declarative { recall}, procedural {how to apply}, contextual {when to apply}, conceptual knowledge {why is appropriate})
    - Help students set realistic expectations
- General strategies to promote metacognition
    - Modeling your metacognitive skills (show how you would approach an assignment)
    - Scaffold students in their metacognitive process (gradually remove support)