USDOL Disclaimer:

Moving from content knowledge to application of knowledge and the   development of problem solving and critical thinking.

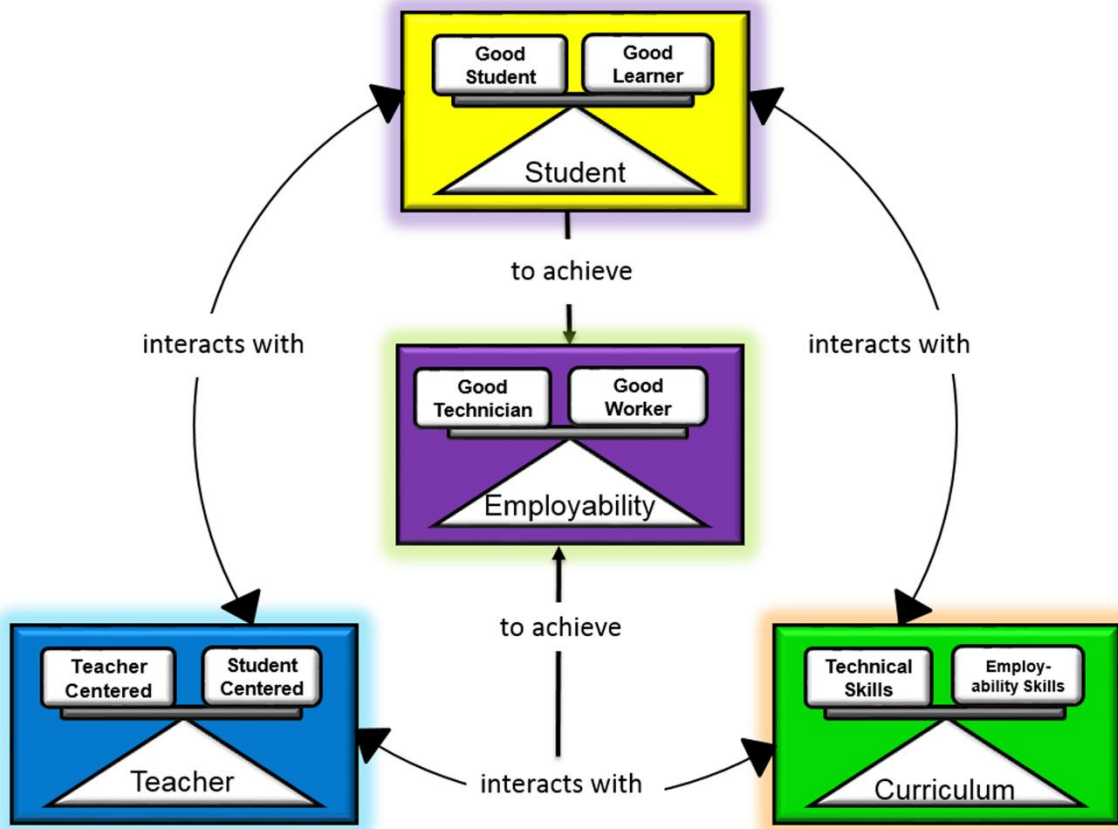Outcomes of this balanced approach meets the demands of the 21st century skill set.

Primary License:

A Balanced Approached to Teaching a Manufacturing Course

Sheckley, B.G. & Vallieres, K.M (2016)

Primary License:

The Role of the STUDENT in the Learning Process
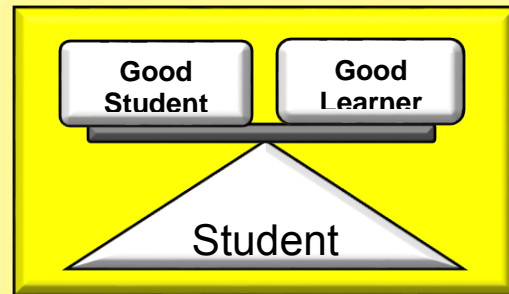
Characteristics of a good student verses a good learner

The Learning Process

Role of Deliberate Practice in learning

Role of Self-Regulation in learning

Objective: To develop and implement teaching practices that will improve students ability to be good problem-based learners.

Primary License:

Good Student vs. Good Learner

Problem Statements:

- What are the characteristics of a good student and a good learner?

- What are the learning outcomes (i.e. competencies, skill sets) of a good student verses a good learner?

- How do these learning outcomes match industry needs?

How do I develop good problem-based learners that will meet industry demand for good workers?

Objective: To incorporate principals that will support the development of student learning skills into course curriculum and teaching practices.

Primary License:

Good Student vs. a Good Learner
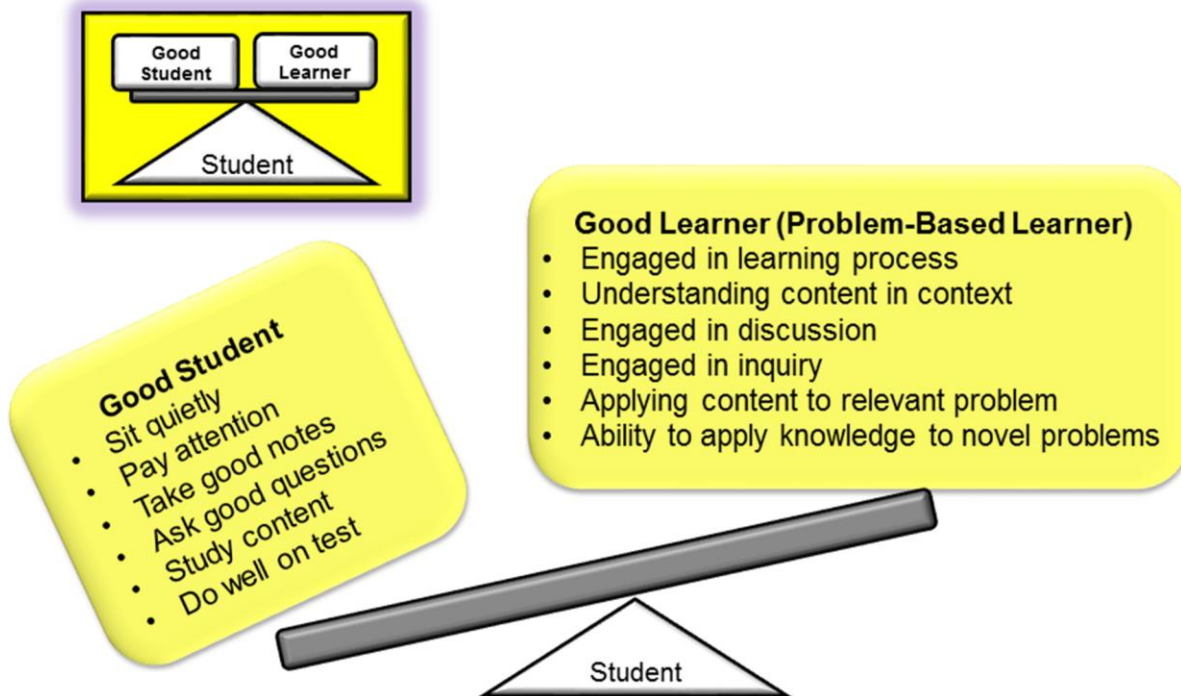
Good Student | Good Learner

Student

Good Student
- Sit quietly
- Pay attention
- Take good notes
- Ask good questions
- Study content
- Do well on test

Good Learner (Problem-Based Learner)
- Engaged in learning process
- Understanding content in context
- Engaged in discussion
- Engaged in inquiry
- Applying content to relevant problem
- Ability to apply knowledge to novel problems

Student

Primary License:

Good Student to Good Learner Continuum

Level 4: Good Problem-Based Learner
• I investigated and analyzed more
• I looked for connections between idea
• I adapted what I knew to different situations
• I talked to myself: How am I doing? What do I know? How can I learn more?

Level 3: Beginning Problem-Based Learner
• I asked more questions
• I asked for help more often
• I identified what I did not know
• I took initiative to learn more

Level 2: Good Student
• I studied and worked hard
• I complete assignments
• I got good grades
• I gave the right answer

Level 1: Beginning Student
• I didn't misbehave
• I was prepared
• I followed directions
• I paid attention

Deci, E., & Ryan, R. (2000). The "what" and "why" of goal pursuits: Human needs and the self-determination of behavior. *Psychological Inquiry, 11*(4), 227-268

Level 1: Beginning Student	Level 2: Good Student	Level 3: Beginning Problem-Based Learner	Level 4: Good Problem-Based Learner
I didn't misbehave. I was prepared. I followed directions. I paid attention.	I studied and worked hard. I complete assignments. I got good grades. I gave the right answer.	I asked more questions. I asked for help more often. I identified what i did not know. I took initiative to learn more.	I investigated and analyzed more. I looked for connections between ideas. I adapted what I knew to be different situations. I talked to myself. How am I doing? What do I know? How can I learn more?

Primary License:

Levels of Learning examples

"I feel like a good learner when…."

Level 1

- I just pay attention to what's happening. There's really nothing to be a good learner. You just have to pay attention.
- I was learning about decimals. I kept close attention to my teacher's work. I followed what she was doing. I made eye contact.

Level 2

- I was trying very hard. I did the best I could.
- I was listening and doing my best. I tried and did not give up easily.

Level 3

- I didn't just rush through all the work to be done. I took my time so I could fully understand the lesson.
- I wrote down important details about the lesson. Then later I used the notes to study for the quiz.

Level 4

- I tried the problems and asked [my teacher] questions to make sure I was doing the work correctly.
- I make myself practice problems and examples to test my knowledge.
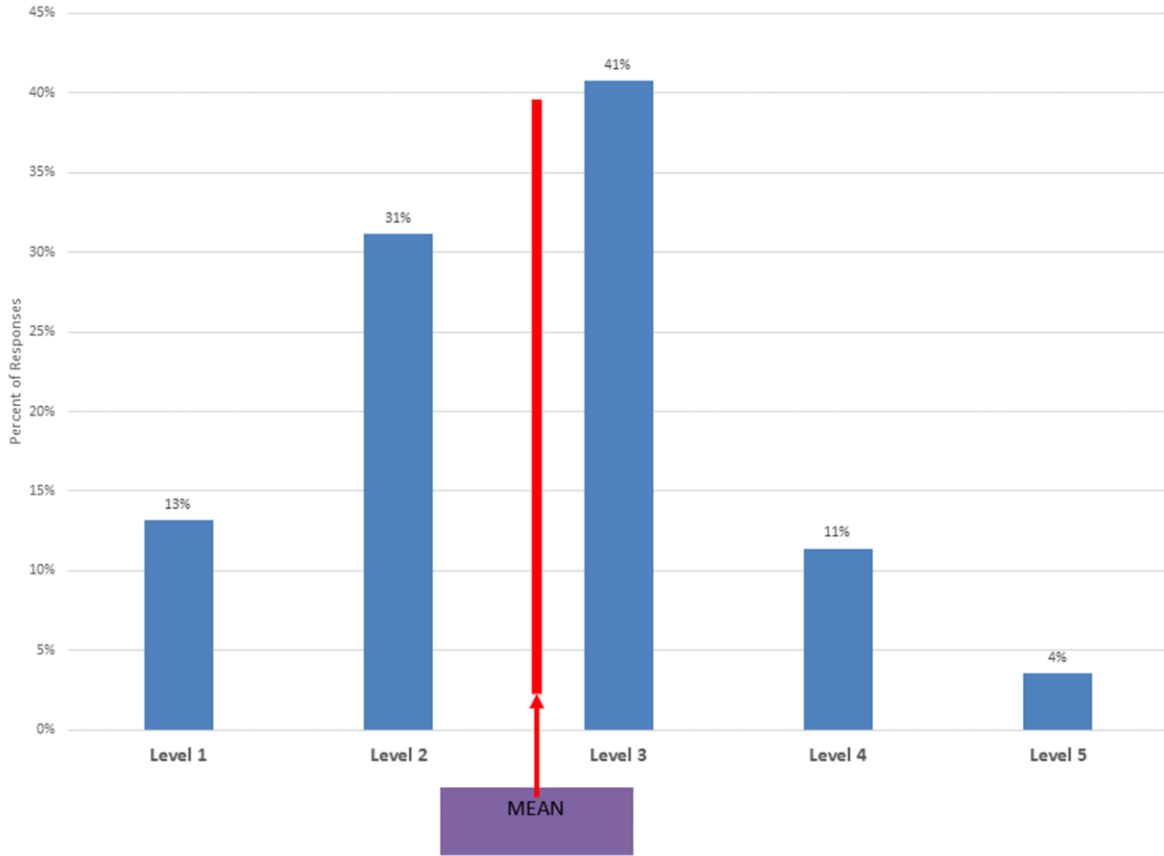
Level 5

- I was proud [to answer the question] and not scared to take a chance of getting it wrong and being embarrassed.
- By searching harder for a good definition I understood the term better…I normally don't go above and beyond like this so it was a big deal for me.
- We were correcting answers to a topic that was hard for me to understand…I engaged my teacher in a discussion about the rules of math surrounding that subject…I got a red pen out and wrote the steps for each problem I got wrong to compare with my original steps.

Primary License:

Descriptions of Being a Good Learner

Below Mean		Above Mean		
Level 1	Level 2	Level 3	Level 4	Level 5
13%	31%	41%	11%	4%

Primary License:

Being a "Good Learner" Cont'd.

When asked to describe a situation in school when they felt like a "good learner,"

- Most students (57%) described times when they worked independently on projects (e.g., Native
American Project, Race to Space Project) or assignments (e.g., making a Flip Book, making a presentation to their class)
- Some students (23%) listed times when they were in a classroom and they understood what their teacher was talking about
- Other students (19%) listed occasions when they received a good mark on a test or a grade on an assignment (e.g., "I got an 'A' and I thought 'WOW'")

Situations Associated with Being a "Good Learner" (N=159)
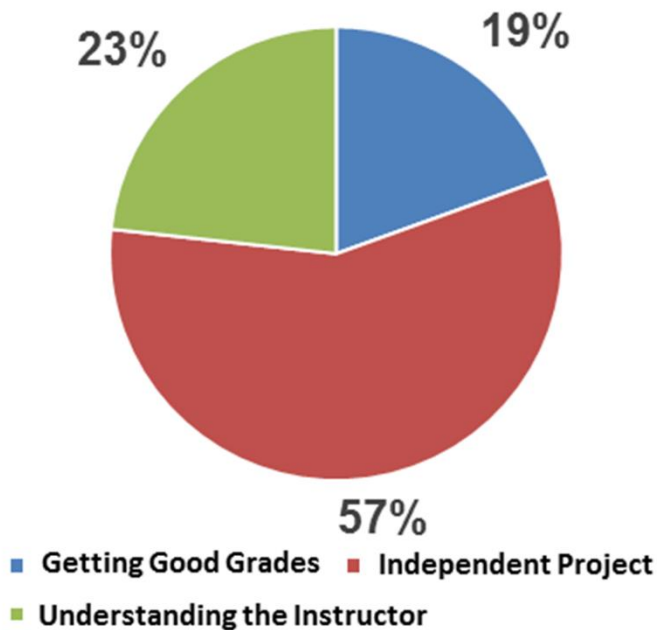
23%   19%

57%

- Getting Good Grades - Independent Project
- Understanding the Instructor

Primary License:

Good Learners Apply Knowledge to Solve Problems

- Good Learners skills are the foundation for good worker skills that are in demand by industry.
- Problem-Based Learners have the skills to use problem situations to advance their own learning.
- Such learners understand that learning typically involves solving a vexing problem:

-How to fill the gap between what they already know and what they need to know — or be able to do — to address a new situation.

Good Learners skills are the foundation for good worker skills that are in demand by industry.

Primary License:

Instructor Self-Assessment
Are you a good student or a good learner?

Think of a time when you were engaged in a learning activity that had a very powerful learning outcome.

1. What were the types of activities you where engage in?
2. What was the learning process like?
3. What made the learning outcomes really strong?
4. How can you replicate this type of learning experience in your classroom or lab with your students?

Please discuss your answers with at least two others, if possible.

Unit 2A: The Learning Process: Role of Deliberate Practice

Problem Statements:

- What are the basic principals of the physical learning process?

- What is deliberate practice?

- What roll does deliberate practice have on the learning process?

How to I develop opportunities for deliberate practice in my classroom and lab?

Objective: To apply learning methods that provide opportunities for deliberate practice.

How do People Learn

- Learning at its fundamental level is a biological process that occurs during the release of chemicals in the brain.

- Learning involves wrapping nerves in myelin sheets, a process that happens during deep or deliberate practice.
  -Learning proceeds best via "deliberate or deep practice"

- Deep, deliberate practice increases the strength and speed of the neuropathways, creating a superhighway of connections.

Primary License:

Learning at the Fundamental Level
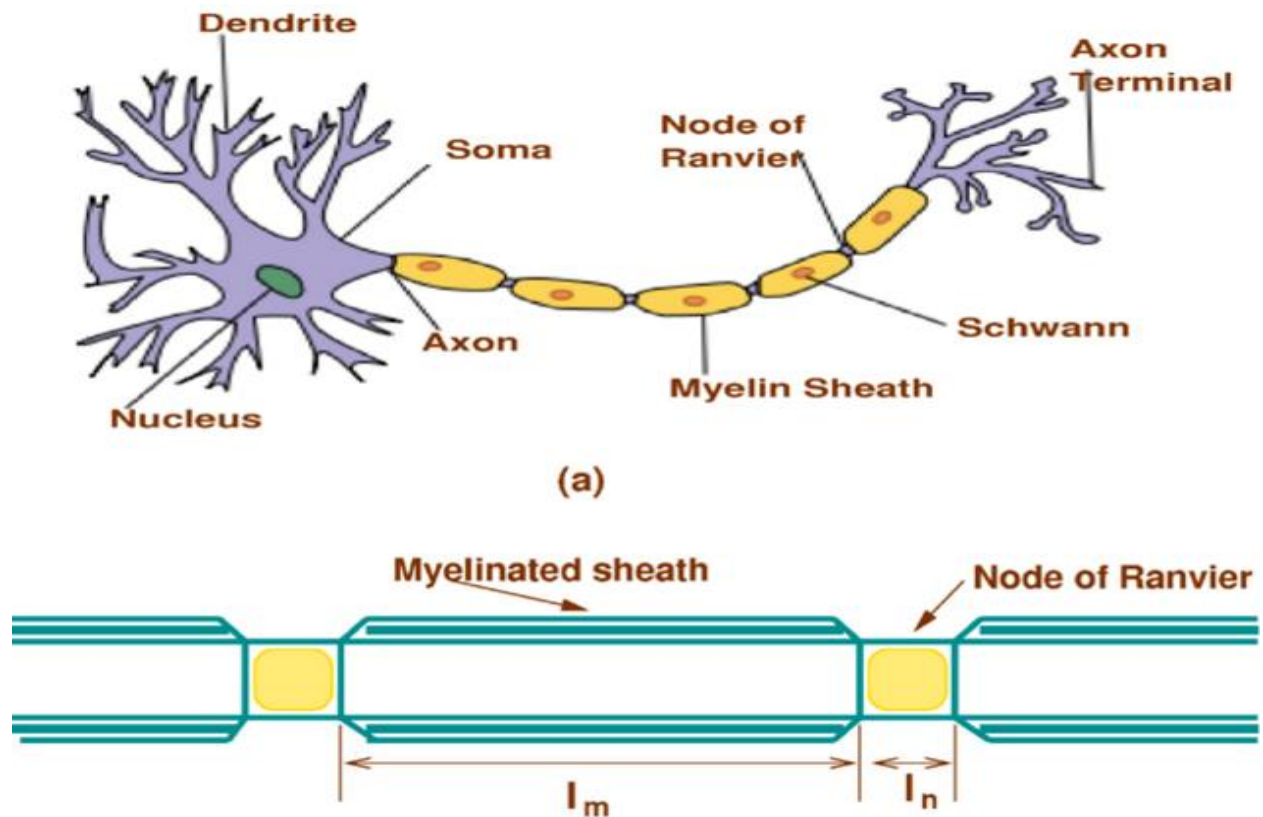
(a)

Primary License:

How We Learn

How We Learn - Synapses and Neural Pathways

(https://www.youtube.com/watch?v=BEwg8TeipfQ)

Expertise is the Result of Deliberate, Deep Practice

- "Expertise is the result of years of effortful, progressive practice on authentic tasks accompanied by relevant feedback and support, with self-reflection and correction.

- This activity is called Deliberate Practice. Others have called it deep practice and intentional practice. It entails considerable, specific, and sustained efforts to do something you can't do well—or at all."

Reference: Tom Gram Deliberate Practice (http://jarche.com/2016/02/deliberate-practice/)

Primary License:

Six Elements of Deliberate Practice

1. Practice must be designed to improve performance.

- Practice must have a goal: The goal must be job/role based and authentic.
- General experience is not sufficient. Years of everyday experience is not the same as deliberate practice and does not necessarily create an expert.
- Years of deliberate practice does create an expert.

2. Practice must be based on authentic tasks.

- The practice must use real work and be performed in the context of on the job. The goal is to compile an experience bank, not a vast list of completed formal training programs.

3. The practice must be challenging.

- The tasks selected for practice must be slightly outside of the learners comfort zone, but not so far out as produce anxiety or panic.
- Deliberate practice is hard work and stretches a person beyond their current abilities.
- The experience must involve targeted effort, focus and concentration

4. Immediate feedback on results.

- Accurate and diagnostic feedback must be continuously available both from people (coaches) and the business results produced by the activity.
- Delayed feedback is also important for actions and decisions with longer term impact as is often the case in knowledge based work.

5. Reflection and adjustment.

- Self-regulatory and metacognitive skills are essential. This includes self-observation, monitoring, and awareness of knowledge and skill gaps.
- Feedback requires reflection and analysis to inform behavior change. Experts make mindful choices of their practice activities.

6. 10 Years.

- For complex work, ten years seems to be the necessary investment of in deliberate practice to achieve expertise. It poses a real challenge for our event based training culture. Of course the less complex the work, the less time required to develop expertise.

Primary License:

Problem-Based Learners:

Individuals who use problem-solving skills to enhance their learning

Consider the difference between deep practice and a routine "expert"

Click on the links to view the videos

Kayleigh – Deep Practice (https://www.youtube.com/watch?v=3qTWH xm5qW0)	Verbatim: Expert Witness (http://www.nytimes.com/video/opinion/10000000411 5589/verbatim-expert-witness.html?em_pos=medium&emc=edit_fs_201512 31&nl=video&nlid=25051222)

Primary License:

16

Activity 2: Deliberate Practice

Instructor and Student Activity:

- Think of a time that you had to practice something repeatedly to get proficient at it.

- Write down the steps you took during the learning practice.

- What steps had the most impact on your learning?

Question:

-What can students "deeply practice" to become skillful problem-based learners?

After posting your answer, please respond to at least two other posts.

Resources on Deliberate Practice

Ericcson, K., Krampe, R. T., Tesch-Romer, C. (1993). The role of deliberate practice in the acquisition of expert performance. Psychological Review.
(http://projects.ict.usc.edu/itw/gel/EricssonDeliberatePracticePR93.pdf)

Gram, T. (2016). Deliberate practice. Harold Jarche.
(http://jarche.com/2016/02/deliberate-practice/)

Self-Regulated Learning
(https://www.youtube.com/watch?v=3OQsT7w6MBM)

Primary License:

Unit 2B: The Learning Process: Role Self-Regulation

Problem Statements:

What is deliberate practice?

What roll does self-regulation have on the learning process?

How to I provide opportunities to develop my students' self-regulation skills in my classroom and lab?

Objective: To apply learning methods that develop students' self-regulation skills.

What is Self-Regulation

Self-regulation is the ability to plan, monitor, and evaluate learning.

Individuals self-regulate to a task at hand in accord with their understanding of the task.

Consider how this student's view would impact self-regulation of learning:

**"There's really nothing to be a good learner.
You just have to pay attention"**

Primary License:

What is Self-Regulation

Self-regulation is the ability to plan, monitor, and evaluate learning.

Individuals self-regulate to a task at hand in accord with their understanding of the task.

Consider how this student's view would impact self-regulation of learning:

**"There's really nothing to be a good learner.
You just have to pay attention"**

Deci, E., & Ryan, R. (2000). The "what" and "why" of goal pursuits: Human needs and the self-determination of behavior. Psychological Inquiry, 11(4), 227-268.

Primary License:

How to Develop Self-Regulation Skills?

[Encouraging Self-Regulated Learning in the Classroom: A Review of the Literature](#)

(http://www.self-regulation.ca/uploads/5/6/2/6/56264915/encouraging_self_regulated_learning_in_the_classroom.pdf)

"Setting goals is the first step in turning the invisible into the visible."

-Tony Robbins

1. **Goal Setting**: There are 5 steps to goal setting:

   1. Set a clear goal.
   2. Set a Challenging Goal: but not unachievable.
   3. Secure Your Commitment.
   4. Get Feedback.
   5. Consider Complexity of Goal: break down.

[Mind Tools. Problem Solving: Solving Complex Business Problems](#)
(https://www.mindtools.com/pages/main/newMN_TMC.htm)

2. **Planning**: occurs in three stages: (1) setting a goal for a learning task, (2) establishing strategies for achieving the goal, and (3) determining how much time and resources will be needed to achieve the goal (Schunk, 2001).

3. **Self-motivation**: when learners recognize the value of completing a goal, and develop strategies to help themselves maintain a focused effort to achieve it.

4. **Flexible Use of Strategies**: (look for different strategies) Successful learners are able to implement multiple learning strategies across tasks and adjust those strategies as needed to facilitate their progress towards their desired goals (Paris & Paris, 2001).

5. **Self-Monitoring**: To become strategic learners, students must track their own efforts towards a learning goal and achievement outcomes (Kistner et al., 2010).

6. **Help-Seeking**: (look for different strategies): Self-regulated learners seek out advice from others, and do so with the goal of making themselves more autonomous. (Ryan et al., 2001)
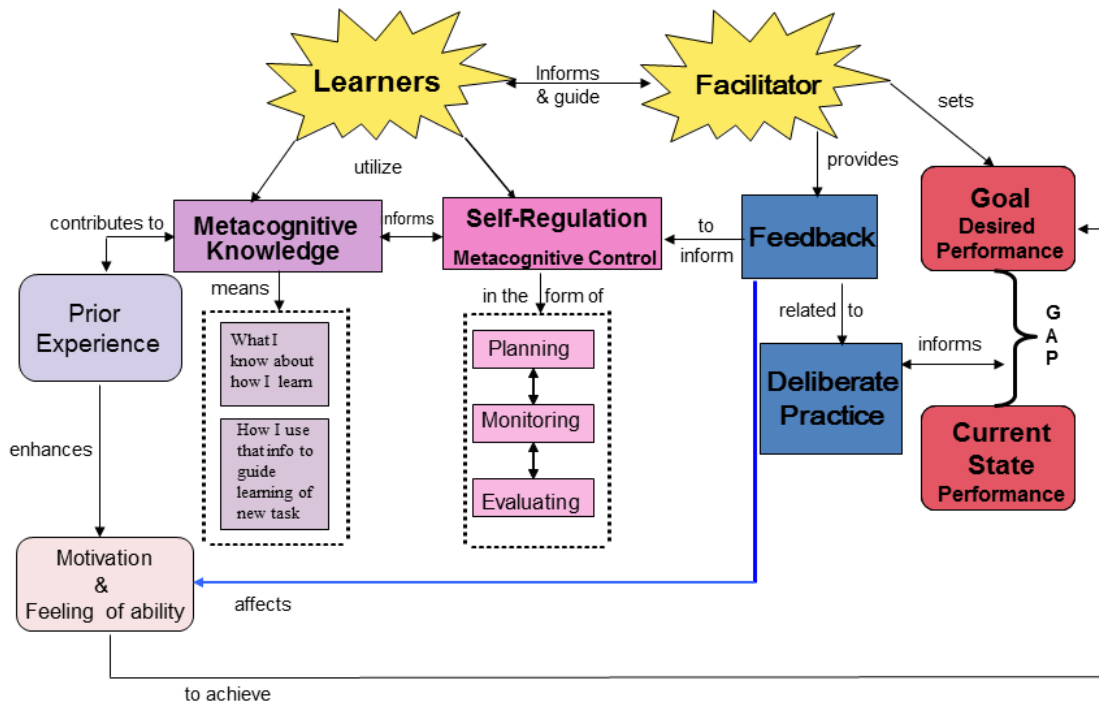
7. **Self-Evaluation**: (look for different strategies): Students are more likely to become self-regulated learners when they are able to evaluate their own learning, independent of teacher-issued summative assessments (Winne & Hadwin, 1998).

Basics of the Learning Process

Basics of the Learning Process
Kelli-Marie Vallieres, PhD
March 24, 2009

Facilitators set performance goals for the learners. Through deliberate practice the facilitator establishes the gap between the performance goal and the learner's current performance state. The facilitator provides feedback, which informs and guides the learner as they utilize metacognitive knowledge and metacognitive control, also known as self-regulation.

Metacognitive knowlesge is what the learner knows and how they use that information to guide their efforts. Metacognitive control takes the form of planning, monitoring, and evaluation.

Together, metacognitive knowledge and metacognitive control contribute to the learner's prior experience, which, along with facilitator feedback, enhance the learner's motivation and understanding of their own abilities, which help the learner achieve the desired performance goals, as set by the facilitator.

Primary License:

Basics of Learning Process: Concept Map Narrative

- Learners that utilize self-regulation skills, (the ability to plan, monitor, and evaluate their learning), informed by their metacognitive knowledge,(what I know about how I learn and how I apply that knowledge to learning), is based on past experiences and enhanced by motivation to achieve a new learning goal.

- Facilitators of learning set learning goals and provide feedback on deliberate practice that informs the gap between the current state of performance and goal (desired state of performance). The facilitator affects student motivation and can inform the development of metacognitive knowledge and self-regulation skills through the experiences they create during the learning process.

Self-Regulation Student Activity: Reflective Journal

Have students keep a journal and make regular entries reflecting on their learning. They should be addressing each of the following points throughout the semester.

- Set goals and learning objective
- Plan how to achieve them
- Determine Motivation
- Controlling Behavior
- Learning Strategies
- Self-evaluate understanding
- Monitor progress
- Help-seeking
- Evaluate outcomes

Primary License:

Resources on Self-Regulation

Bandura, A. (1991). Social Cognitive Theory of Self Regulation. Organizational Behavior and Human Decision Process
(http://www.uky.edu/~eushe2/BanduraPubs/Bandura1991OBHDP.pdf)

Edwards, L. (2013). Self-Regulated Learning
(https://www.youtube.com/watch?v=3OQsT7w6MBM)

Latham, G., & Locke, E. (1991). Self-Regulation through Goal Setting. Organizational Behavior and Human Decision Process
(http://www.sciencedirect.com/science/article/pii/074959789190021K)

Lunenburg, F. (2011). Goal Setting Theory of Motivation. International Jounral of Management, Business, and Administration.
(http://www.nationalforum.com/Electronic%20Journal%20Volumes/Lunenburg,%20Fred%20C.%20Goal-Setting%20Theoryof%20Motivation%20IJMBA%20V15%20N1%202011.pdf)

Mind Tools: Locke's Goal-Setting Theory: Setting Meaningful, Challenging Goals.
(https://www.mindtools.com/pages/article/newHTE_87.htm)

Zumbrunn, S. (2011). Encouraging Self-Regulated learning in the Classroom: A Review of the Literature. Metropolitan Educational Research Consortium
(http://www.self-regulation.ca/uploads/5/6/2/6/56264915/encouraging_self_regulated_learning_in_the_classroom.pdf)

How We Learn - Synapses and Neural Pathways via YouTube
(https://www.youtube.com/watch?v=BEwg8TeipfQ)

Deliberate Practice by Harold Jarche
(http://jarche.com/2016/02/deliberate-practice/)

Kayleigh - Deep Practice (The Talent Code) via YouTube
(https://www.youtube.com/watch?v=3qTWHxm5qW0)

[The Role of Deliberate Practice in the Acquisition of Expert Performance by Anders Ericsson et al.](http://projects.ict.usc.edu/itw/gel/EricssonDeliberatePracticePR93.pdf)
(http://projects.ict.usc.edu/itw/gel/EricssonDeliberatePracticePR93.pdf)

[Verbatim: Expert Witness by New York Times](http://www.nytimes.com/video/opinion/100000004115589/verbatim-expert-witness.html)
(http://www.nytimes.com/video/opinion/100000004115589/verbatim-expert-witness.html?em_pos=medium&emc=edit_fs_20151231&nl=video&nlid=25051222)

[Problem Solving: Solving Complex Business Problems by MindTools](https://www.mindtools.com/pages/main/newMN_TMC.htm)
(https://www.mindtools.com/pages/main/newMN_TMC.htm)

[Self-Regulation through Goal Setting by Gary Latham and Edwin Locke](http://www.sciencedirect.com/science/article/pii/074959789190021K)
(http://www.sciencedirect.com/science/article/pii/074959789190021K)

[Goal-Setting Theory of Motivation by Fred Lunenburg](http://www.nationalforum.com/Electronic%20Journal%20Volumes/Lunenburg,%20Fred%20C.%20Goal-Setting%20Theoryof%20Motivation%20IJMBA%20V15%20N1%202011.pdf)
(http://www.nationalforum.com/Electronic%20Journal%20Volumes/Lunenburg,%20Fred%20C.%20Goal-Setting%20Theoryof%20Motivation%20IJMBA%20V15%20N1%202011.pdf)

[Social Cognitive Theory of Self-Regulation by Albert Bandura](http://www.uky.edu/~eushe2/BanduraPubs/Bandura1991OBHDP.pdf)
(http://www.uky.edu/~eushe2/BanduraPubs/Bandura1991OBHDP.pdf)

[Encouraging Self-Regulated Learning in the Classroom: A Review of the Literature by Sharon Zumbrunn](http://www.self-regulation.ca/uploads/5/6/2/6/56264915/encouraging_self_regulated_learning_in_the_classroom.pdf)
(http://www.self-regulation.ca/uploads/5/6/2/6/56264915/encouraging_self_regulated_learning_in_the_classroom.pdf)