The Master Adaptive Learner as a model for learning and teaching

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Goal of Medical Education?

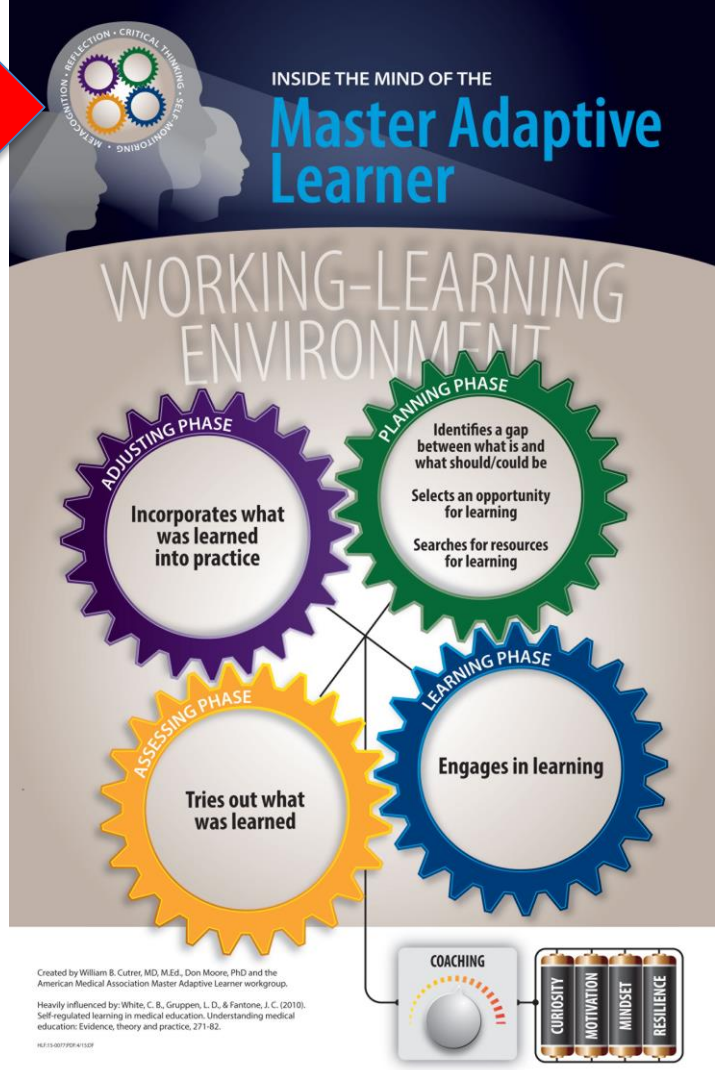
Expert Physicians/Scientists

Expert Thinkers

Expert Learners

What is a Master Adaptive Learner?

- Learning for now
  - Retrieval
- Learning for next year
  - Application
- Learning for 20 years from now
  - Replacing and updating



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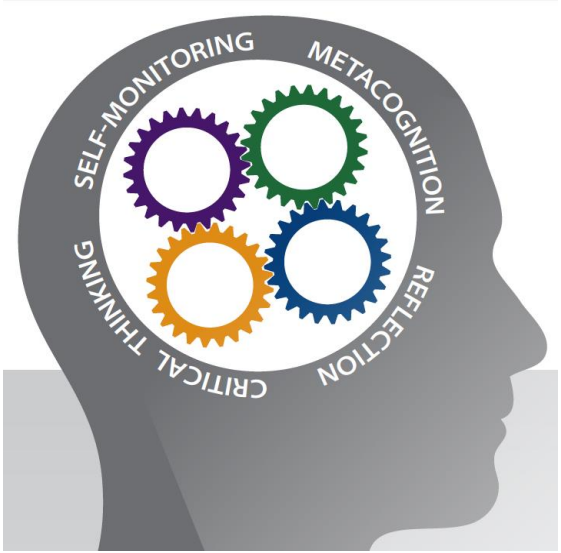


Self-Monitoring

- Noticing one's own actions while acting

Epstein et al (2008) *Cont Educ Health Prof*

Metacognition

- Setting goals, planning an approach, monitoring progress, and making adjustments

Colvin Clark (2008) *Building Expertise*

Reflection

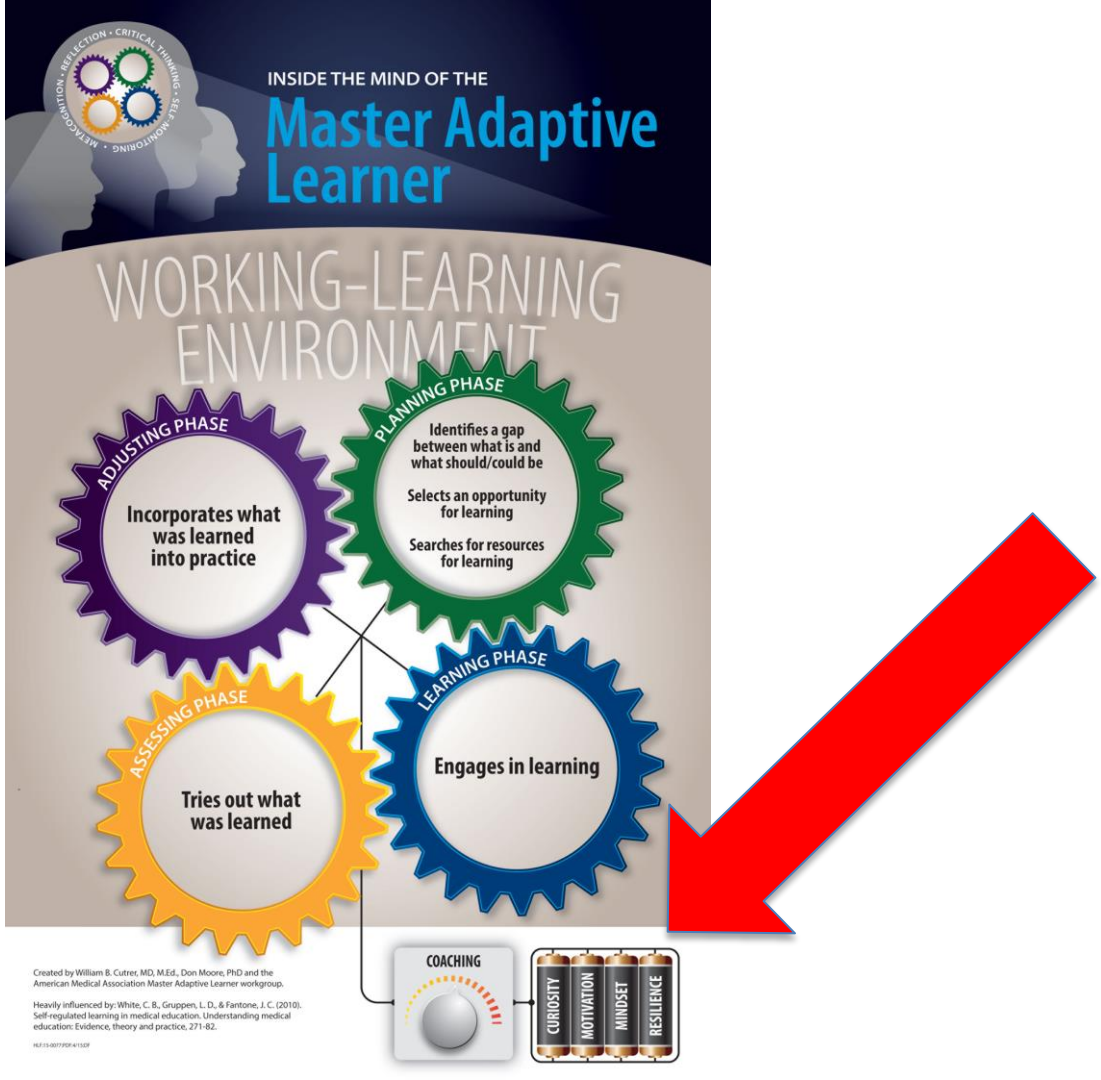
- Developing greater understanding before, during and after situations

Sandars (2009) *Med Teach*

Critical Thinking

- Higher-order cognitive skills and deliberate thinking

Papp et al. (2014) *Acad Med*


METACOGNITION · REFLECTION · CRITICAL THINKING · SELF MONITORING
INSIDE THE MIND OF THE
Master Adaptive Learner
WORKING-LEARNING ENVIRONMENT
ADJUSTING PHASE
Incorporates what was learned into practice
PLANNING PHASE
Identifies a gap between what is and what should/could be
Selects an opportunity for learning
Searches for resources for learning
ASSESSING PHASE
Tries out what was learned
LEARNING PHASE
Engages in learning
COACHING
CURIOSITY
MOTIVATION
MINDSET
RESILIENCE
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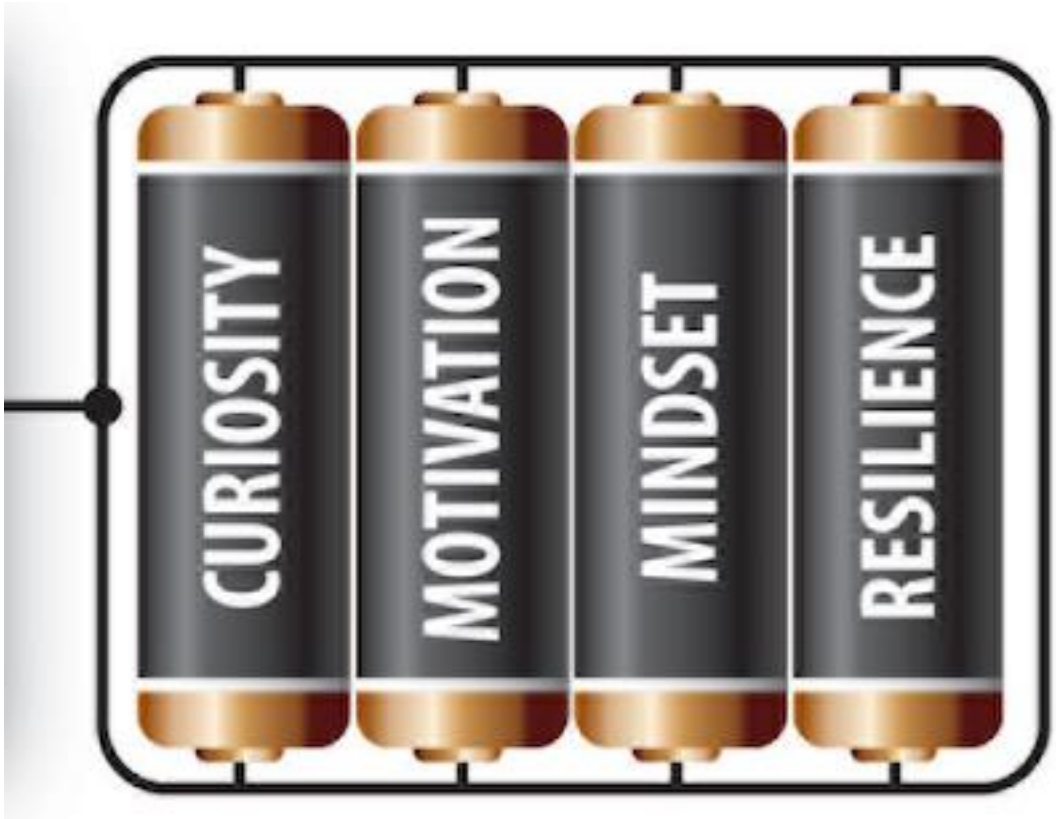
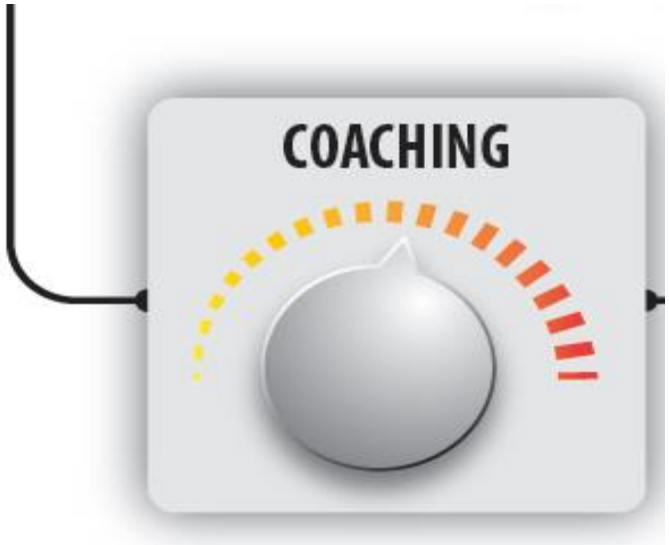
Learner Characteristics

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RONMENT
PLANNING PHASE
Questioning
Searching
Change magnitude
Goal Setting

Planning: Gap recognition

- Failure of routine expertise
- Boundaries of competence
- Surprises
- Challenges from others

Taking Action

- Numerous gaps or questions – which to pursue?
  - Priorities
  - Payoff
  - Ease of closing the gap

Taking Action

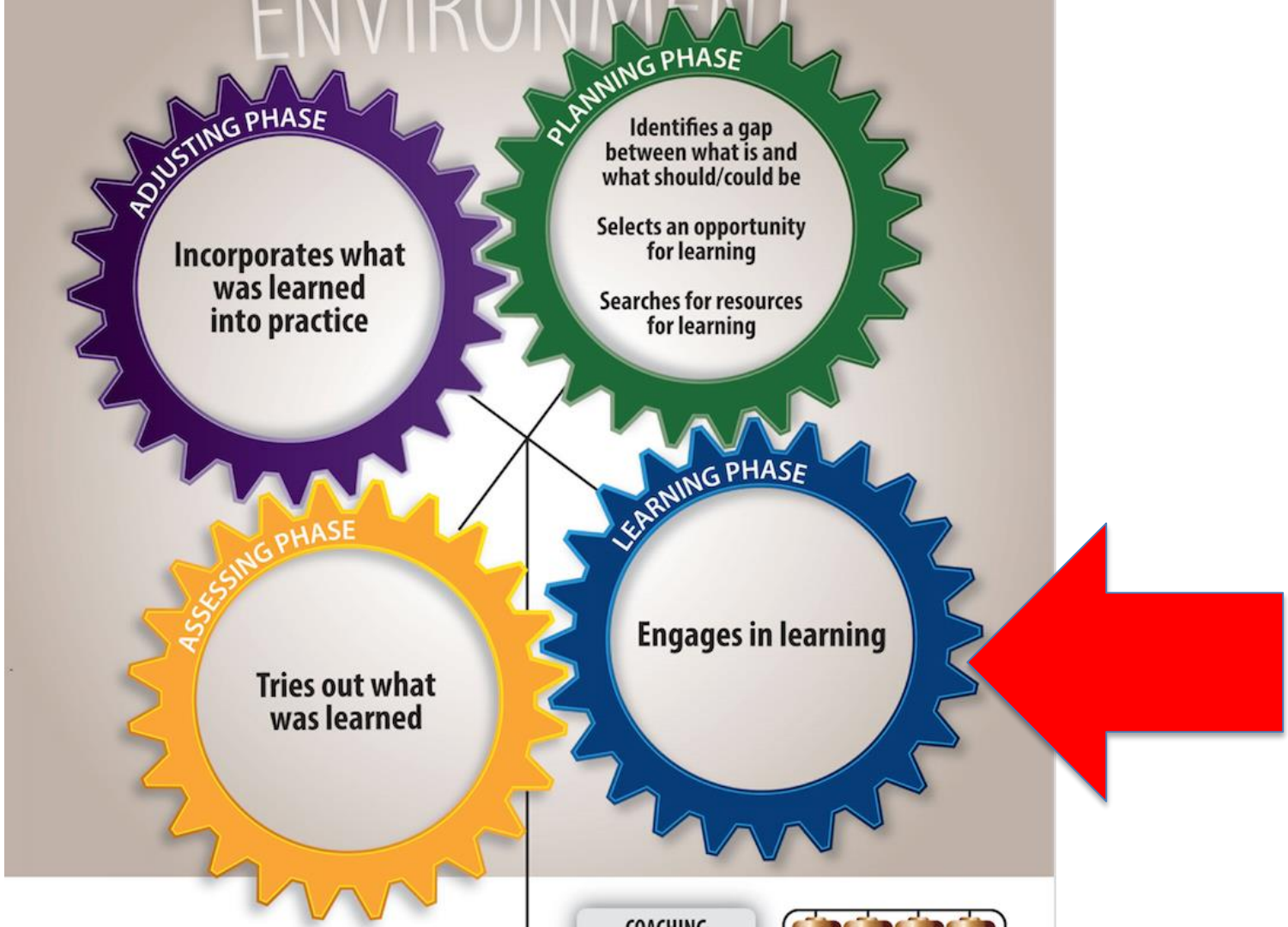
- How to close the gap
  - Resources
  - Strategies
  - When to stop

Epistemology of Uncertainty

- Uncertainty in the values of parameters
- Profound uncertainty about mechanisms
- Personal or collective uncertainty

Promoting Gap Awareness

- Filling gaps is fundamental to SRL
- No gaps = no learning
- Encourage gap awareness through questions
  - Socratic questioning (not “pimping”)
  - Critical thinking techniques
- Respecting Rumsfeld – the unknown unknowns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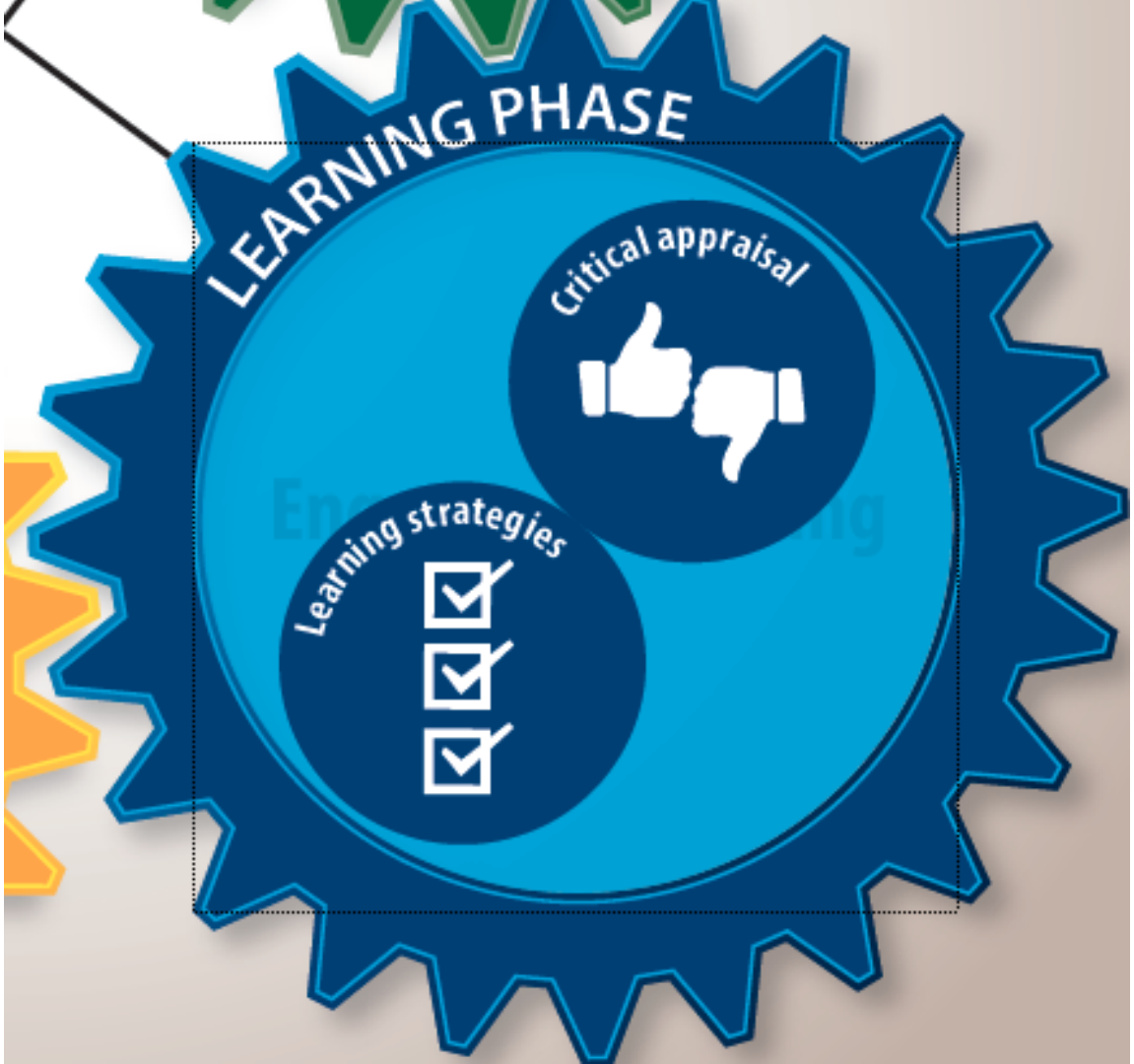

LEARNING PHASE
Critical appraisal
Learning strategies

Learning Strategies

- Bad strategies
  - Rereading
    - Time consuming
    - No durable memory
    - Self-deception/false sense of familiarity
  - Highlighting and underlining
  - Massed practice
  - Cramming
- Learning is deeper and more durable when it is effortful

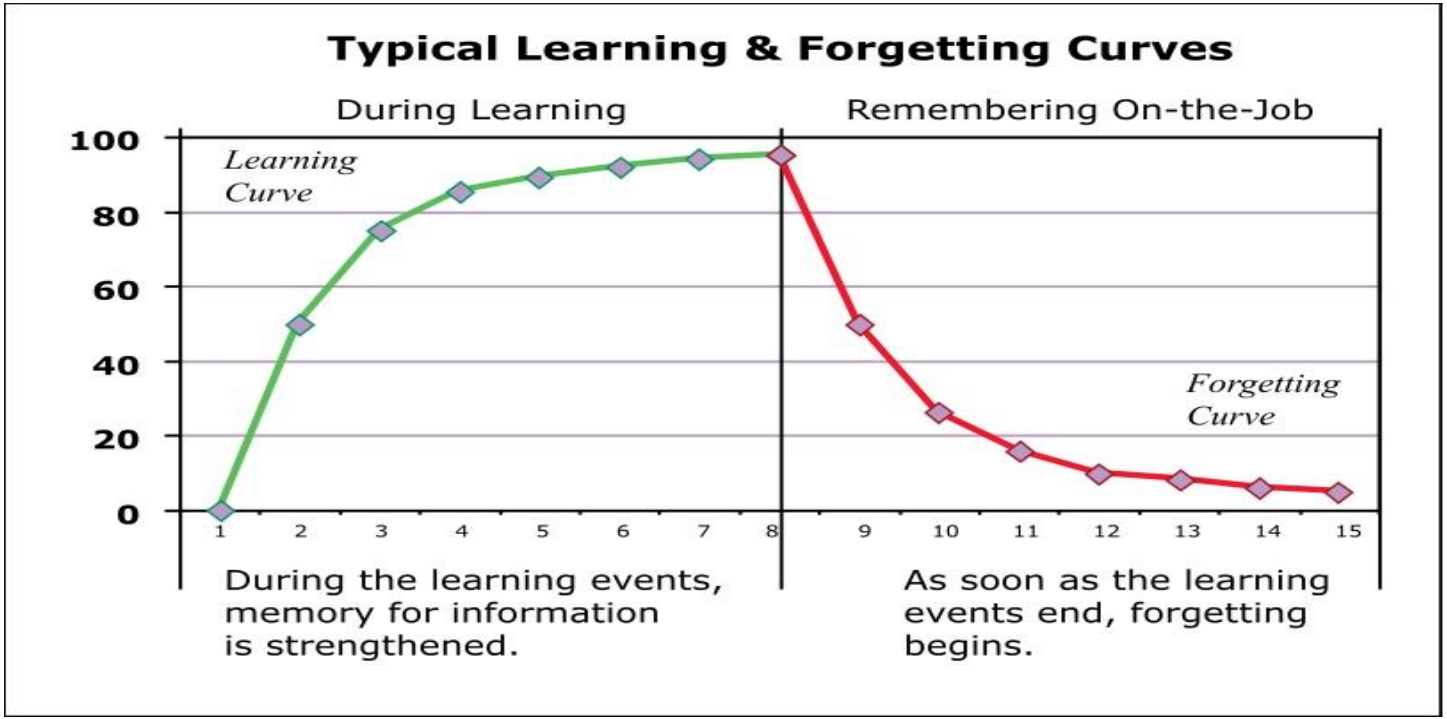
Knowledge Retrieval Strategies

- Testing as a learning tool vs. a "dipstick"
- Build better mastery when using testing as a tool to identify and bring up areas of weakness

Spaced Repetitious Learning

- Learning that is spaced out over time involving repetition to increase learning
- Particularly beneficial when retention is the goal
- Difference between rote memorization and revisiting a topic over time

Spaced Repetitious Learning



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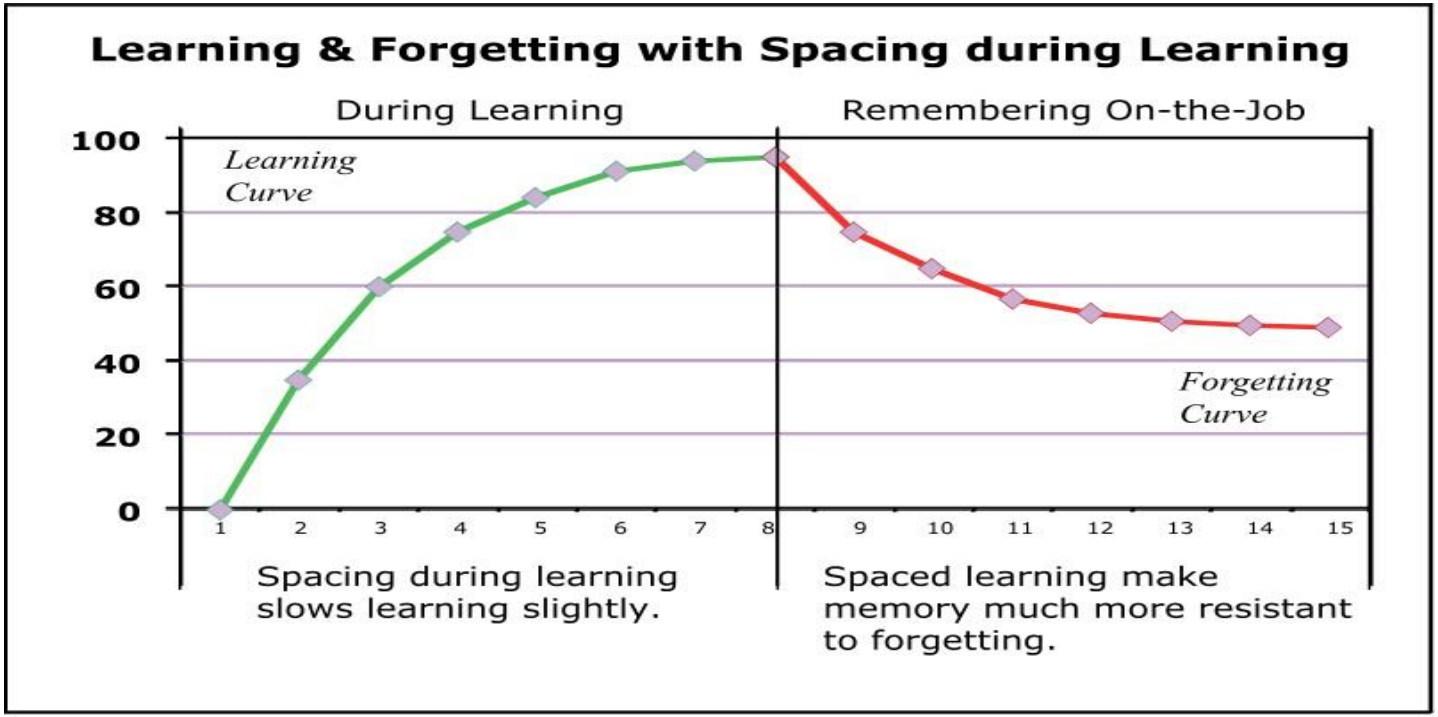
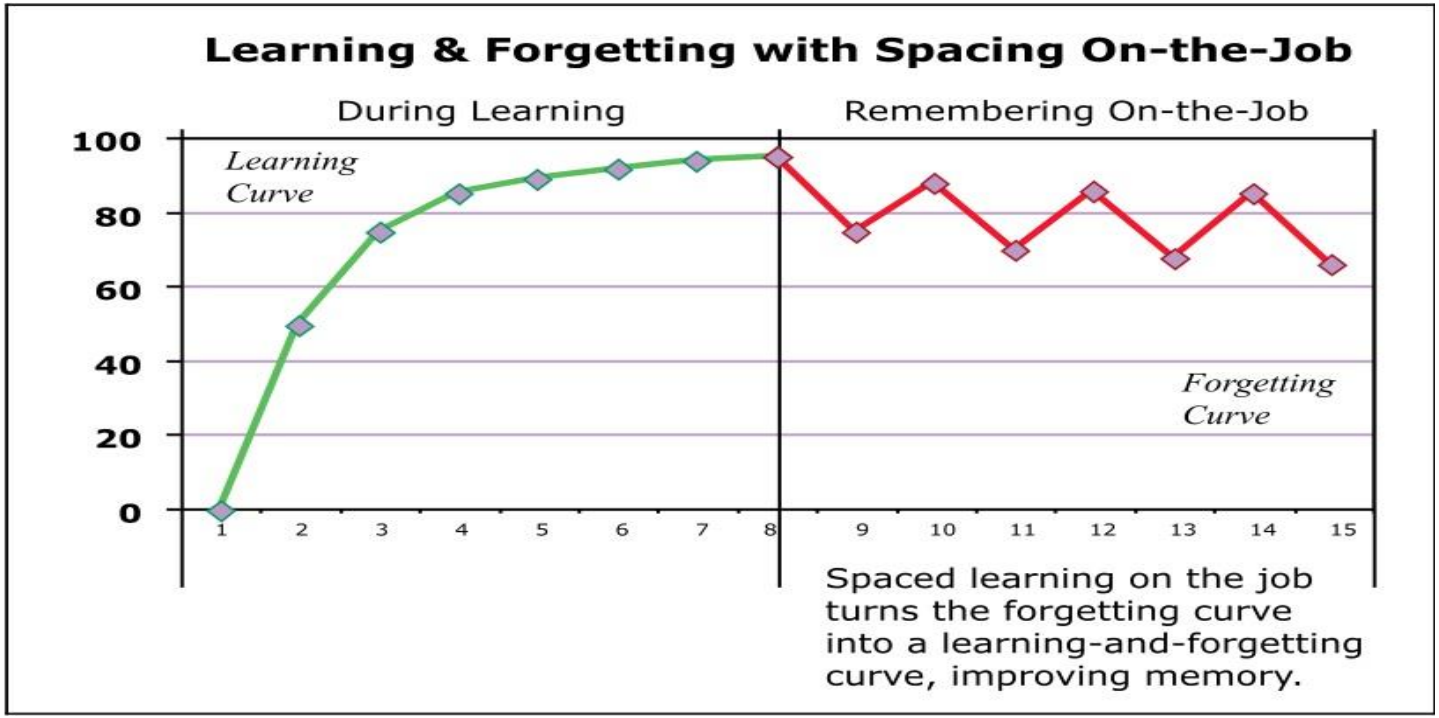
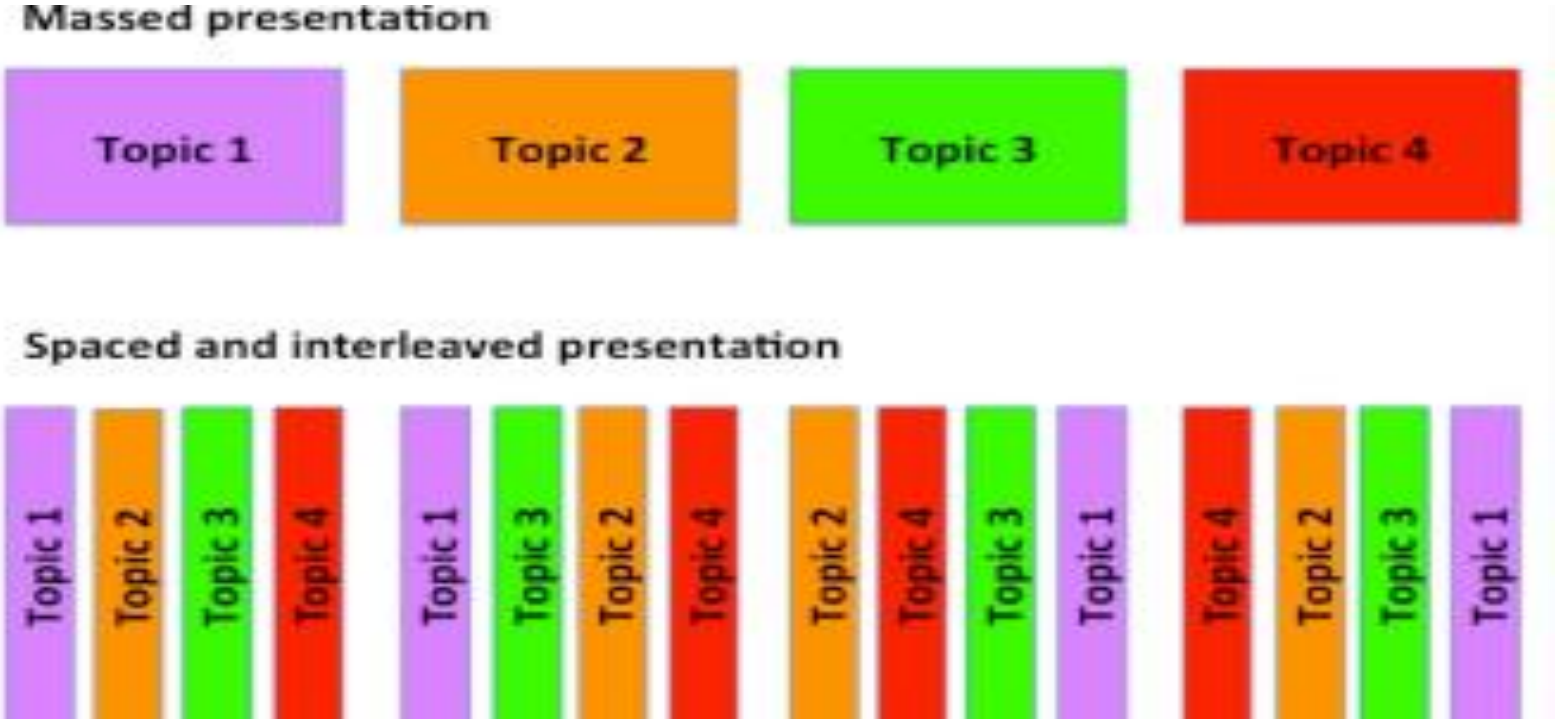


Learning Strategies:
Spaced Repetitious Learning



Learning Strategies: Interleaving



Learning Strategies: Interleaving

- Including the study of two different subjects within a given study period
- Learning feels slower than massed practice of the same topic
- Advantages
  - Promotes cognitive connections among topics
  - Allows for development of discrimination skills

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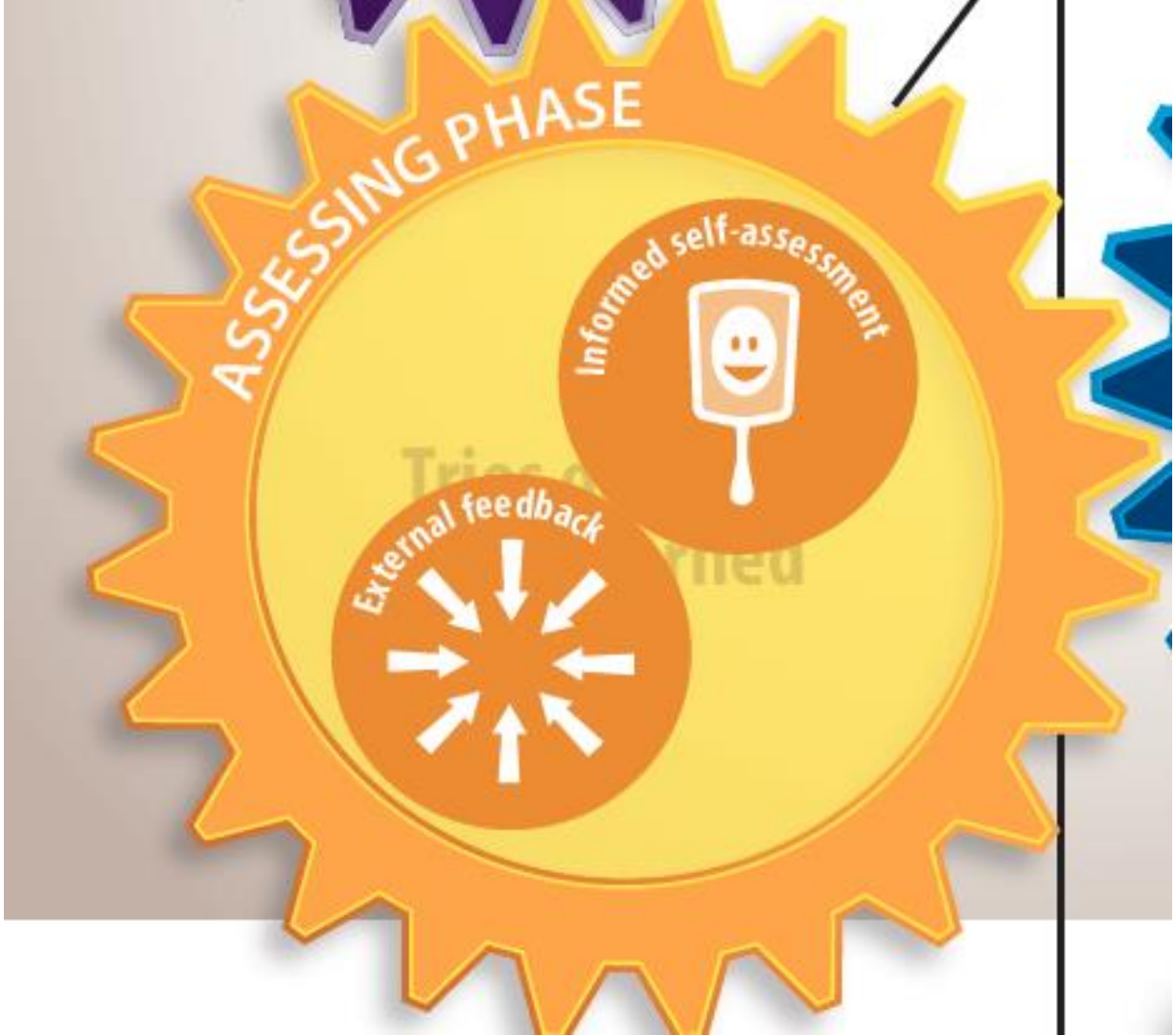

ASSESSING PHASE
Informed self-assessment
External feedback

Learning ≠ Application

- Learning is consolidated by putting it to practice and evaluating the results
- Often using the same situations that led to the original gap identification

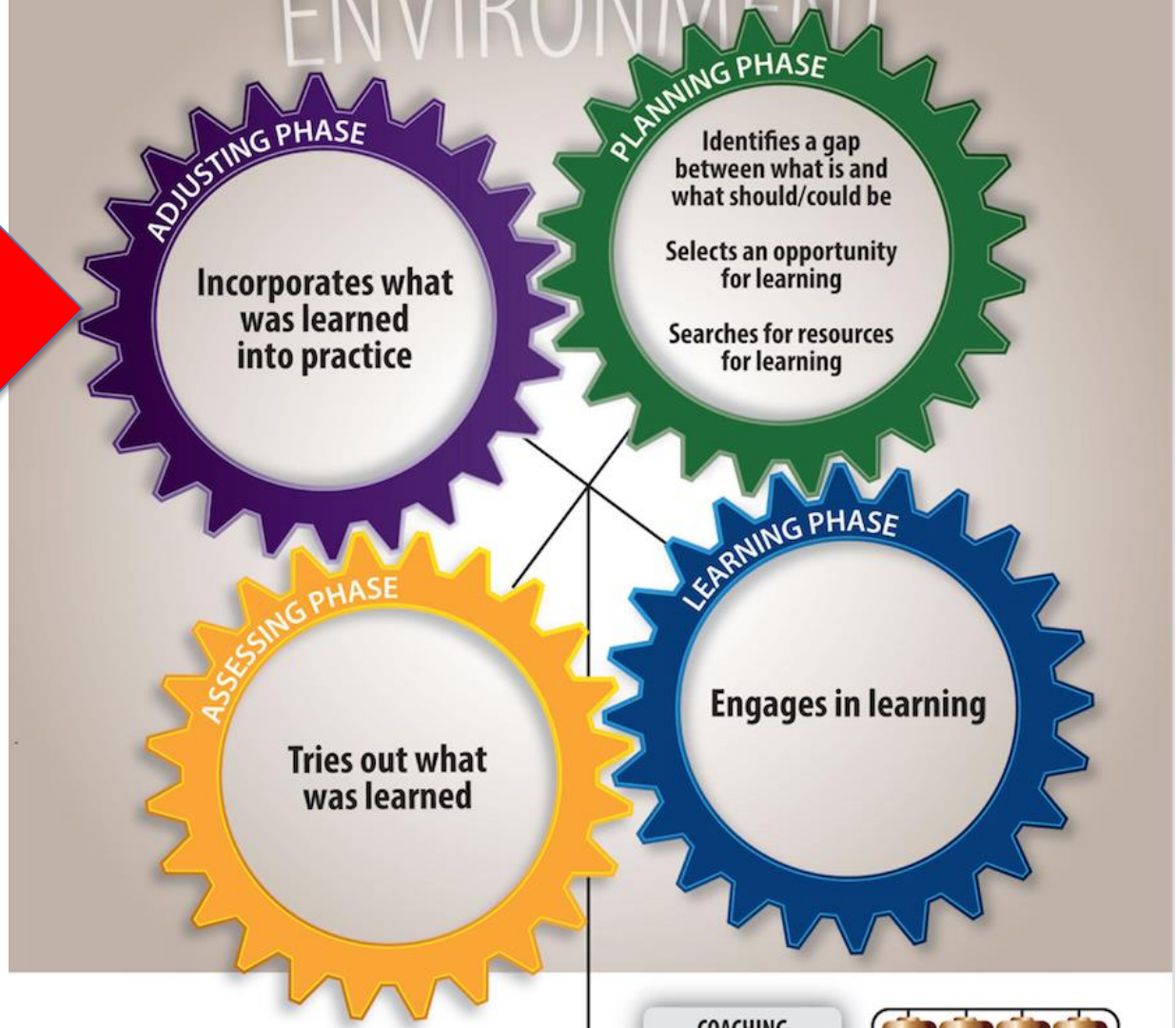
Assessing the Learning

- Self assessment is notoriously invalid
  - Lake Wobegon is pervasive
  - Confidence ≠ competence

	Incompetent	**Competent**
Unconscious	Starting point	Application and practice
Conscious	Gap recognition	After learning

Assessing the Learning

- External assessment is difficult to get
  - Identifies a problem, but not the remedy
  - Seldom specific
  - Not timely or cheap
  - The value of routine monitoring, dashboards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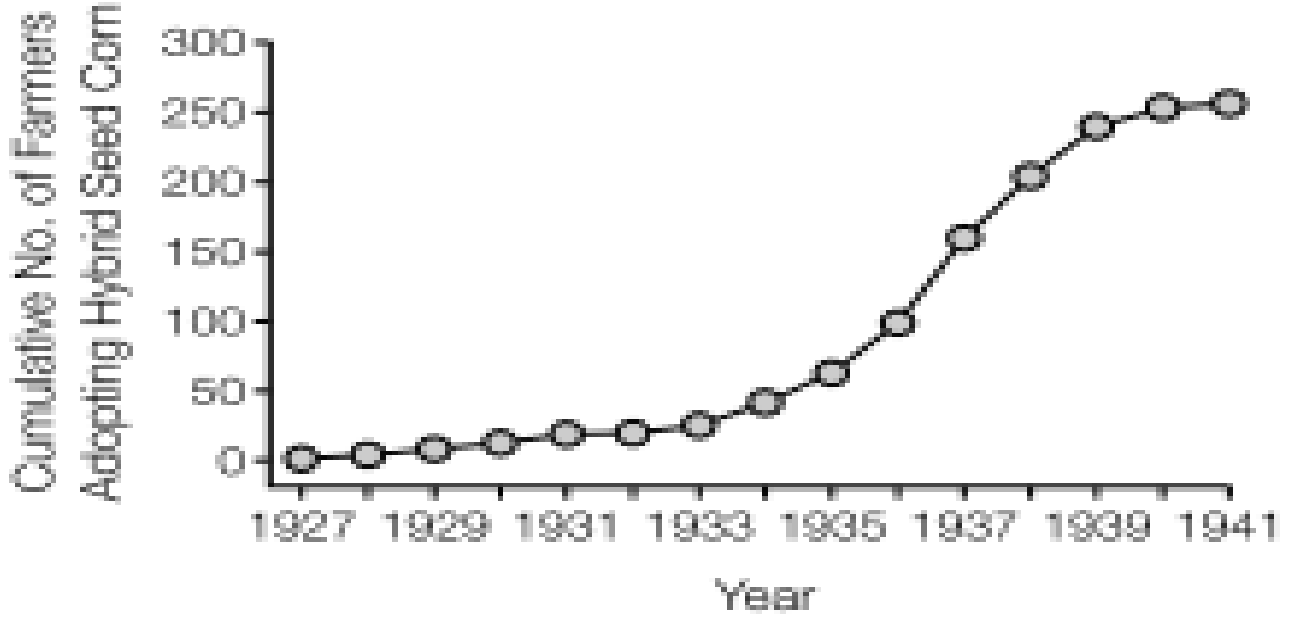
ADJUSTING PHASE
Routine vs. novel application
Individual vs. system implementation

Adoption of Innovation

- Adoption process takes place in five stages:
  - Knowledge
  - Persuasion
  - Decision
  - Implementation
  - Confirmation
- Adoption may fail at any stage
- People vary in their rate of adoption

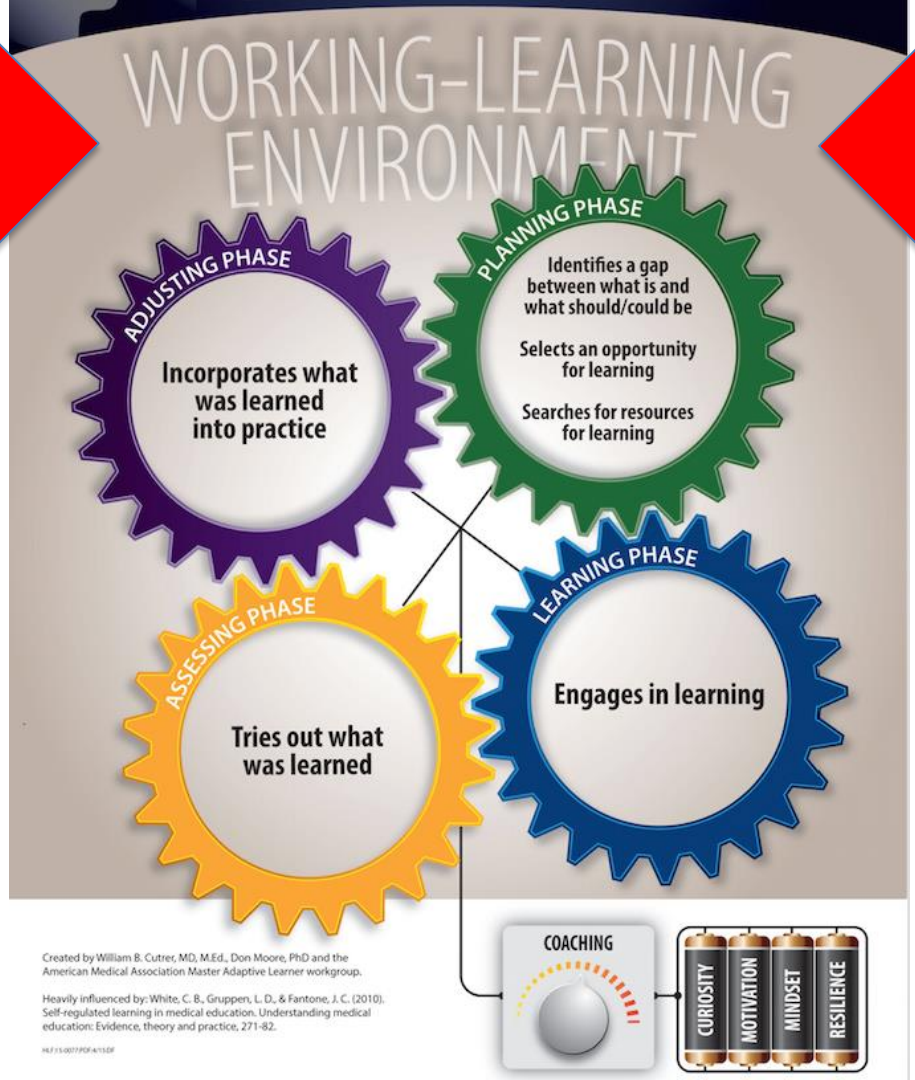
Typical Adoption Curve

Figure 1. Cumulative Number of Adopters of Hybrid Seed Corn in 2 Iowa Communities



Promoting Adoption

- Supportive environment
  - Culture of adaptation
  - Tolerant of errors
- Information and feedback
  - Info infrastructure and analysis
  - Peer review and consultation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Questions?

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