




Deep and Flexible Learning

for the General Education Student
in three acts

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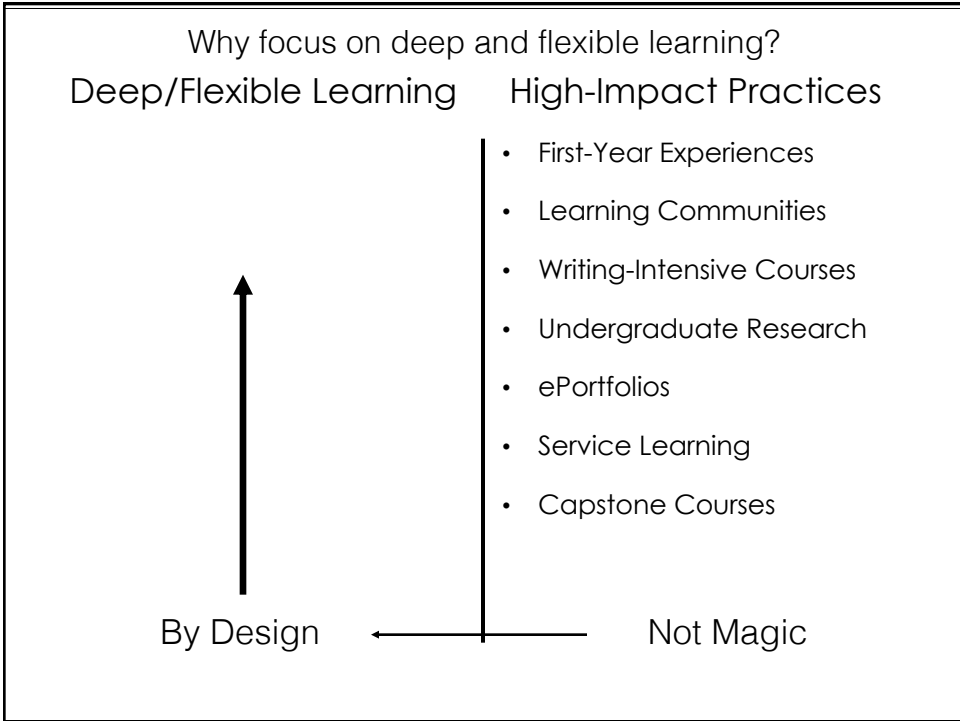
 Institute on General Education and Assessment

Anticipation Guide

Directions: Agree, Disagree, or Edit each statement.

1. Deep learning in students is fostered by aligning teaching styles with learning styles.
2. Technology allows teachers to teach more powerfully, more efficiently, and with less effort.
3. Assessments should be designed to determine what students know and do not know.

5 minute →



Deep and Flexible Learning

in three acts

model the learning

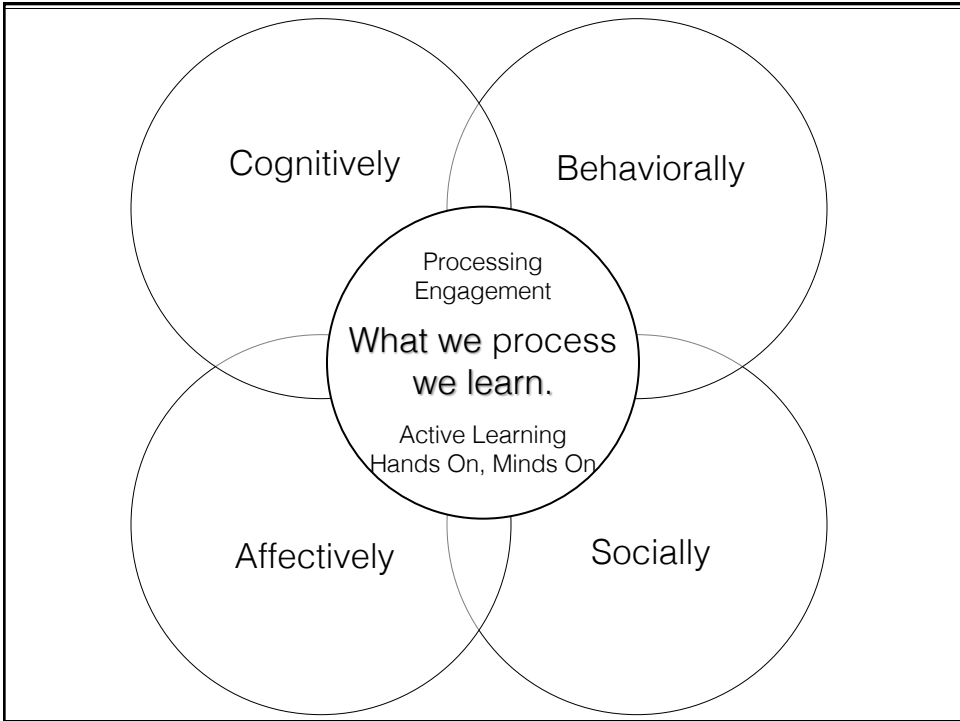
Act 1



words →

Debrief

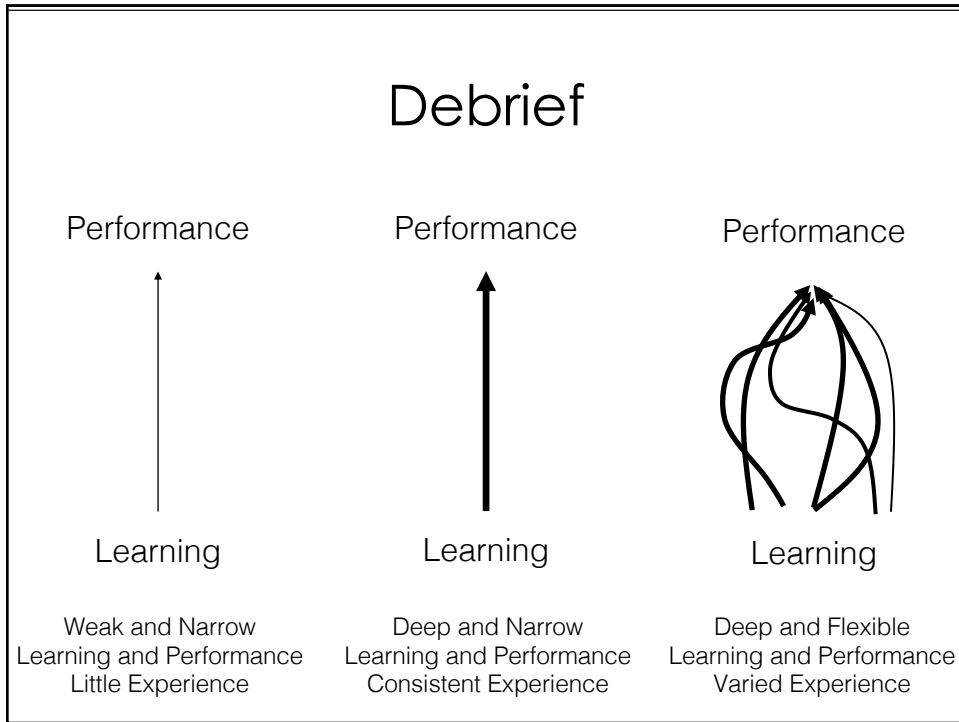
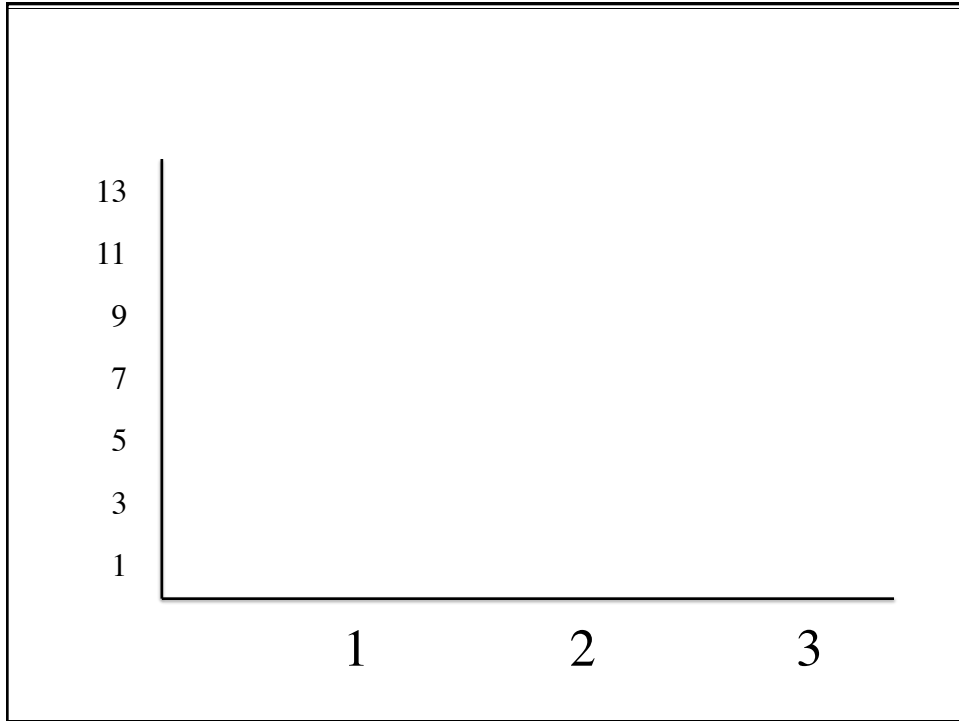
1. Meaning is constructed during experience.
2. Knowledge/meaning construction result from processing.
3. Knowledge is organized.
4. When specifics are lost, meaning remains.
5. Strategies are used to function more effectively.
6. We can assess the effectiveness of our thinking.



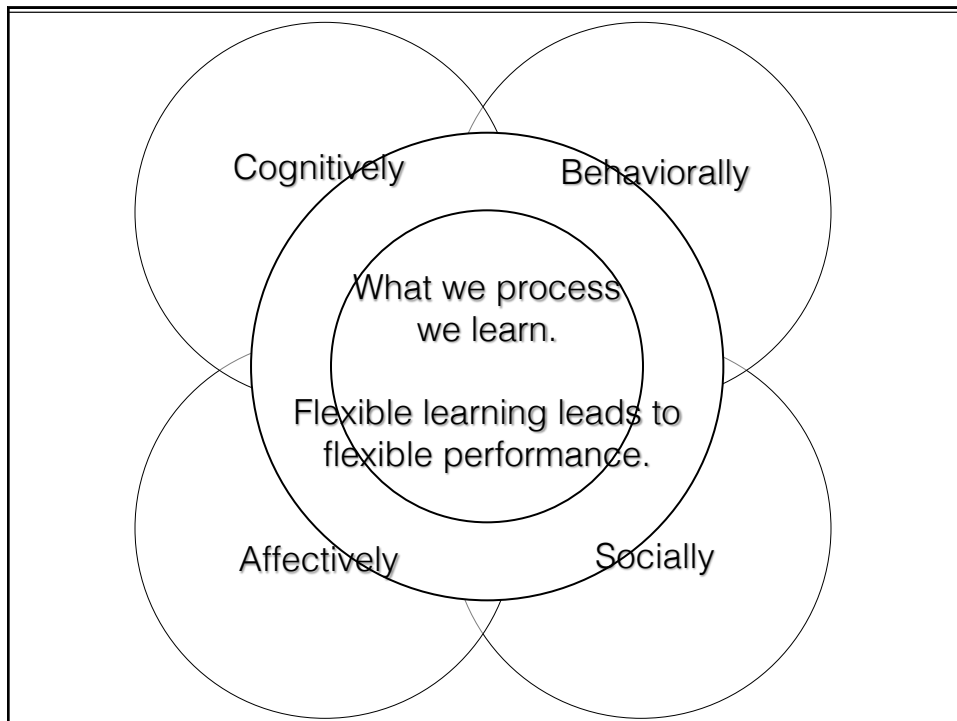
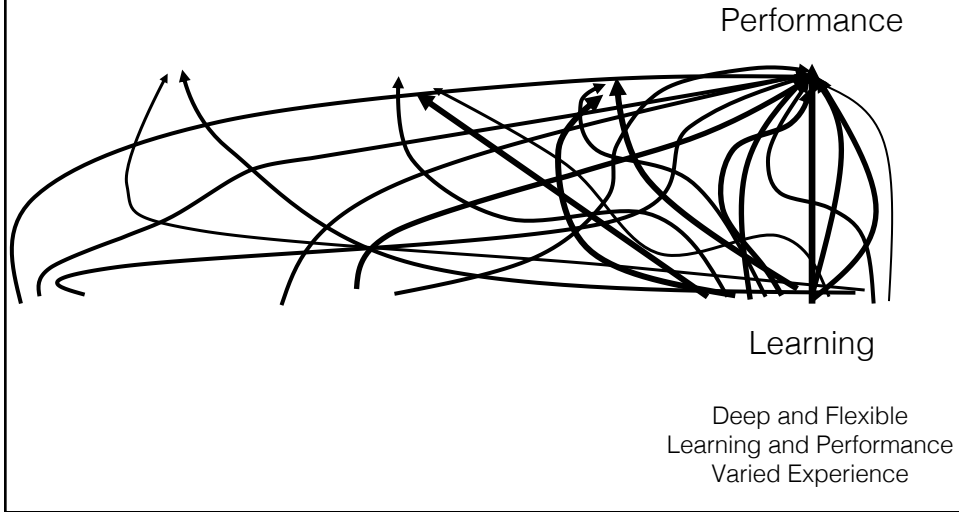
Act 2



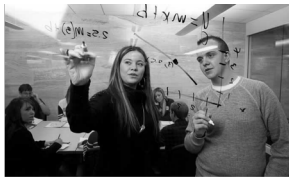
cues →



Debrief



Act 3



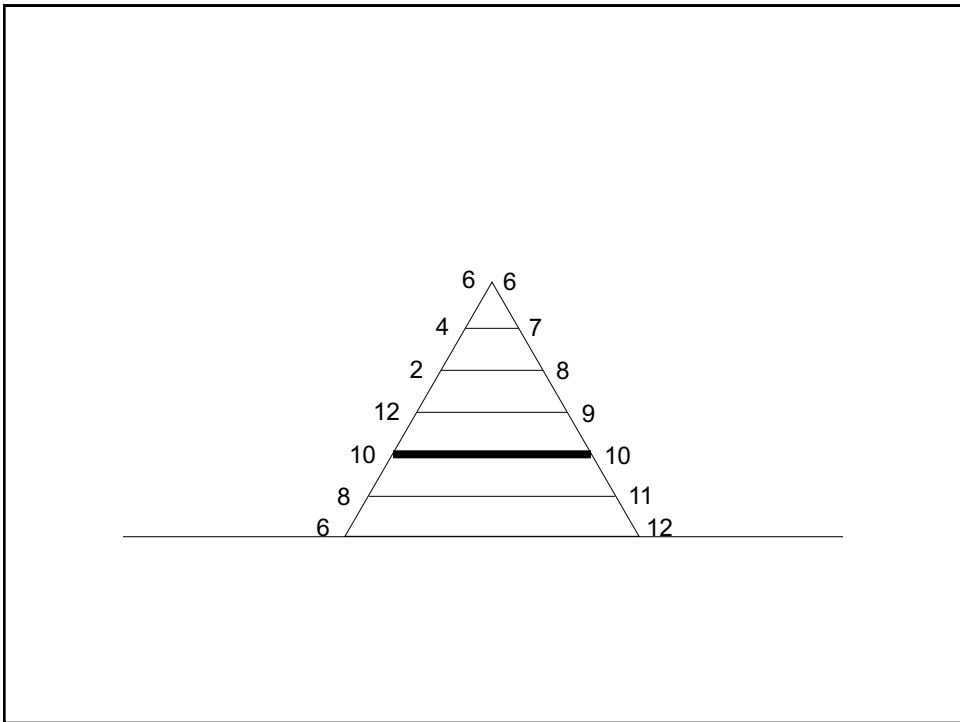
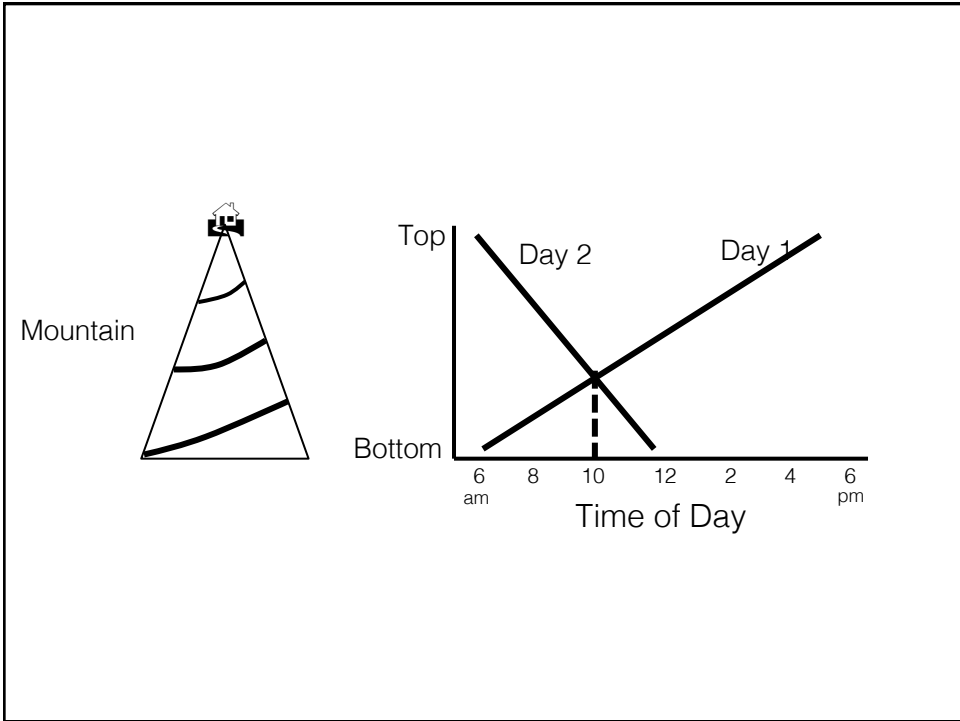
hiking →

A Problem

A hiker is looking for a one-night get-away and decides to climb the path to McAfee's Knob, spend the night at the top, and then to traverse back down the path the next day.

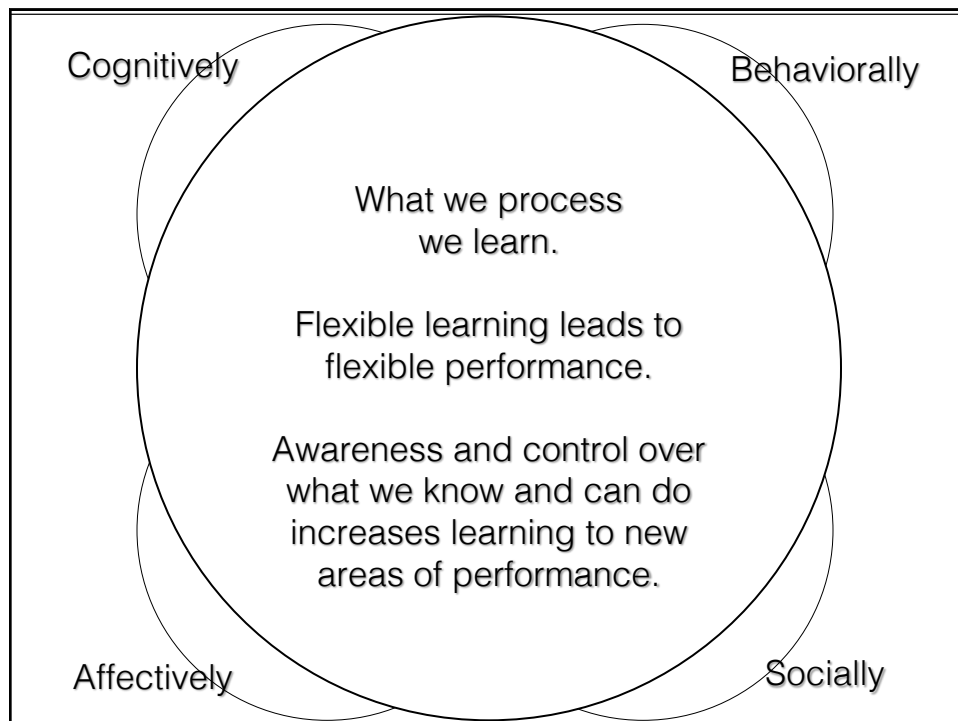
The narrow path spirals around and around the mountain (the only path to the top). The hiker begins walking up the mountain at sunrise and walks all day, reaching the top at about sunset. The hiker spends the night at the top. At sunrise the next morning, the hiker begins walking down the mountain, arriving at the bottom around noon.

The question is: Is there a point on the path when the hiker is coming down that she passed at the same time of day when she was climbing up the mountain?

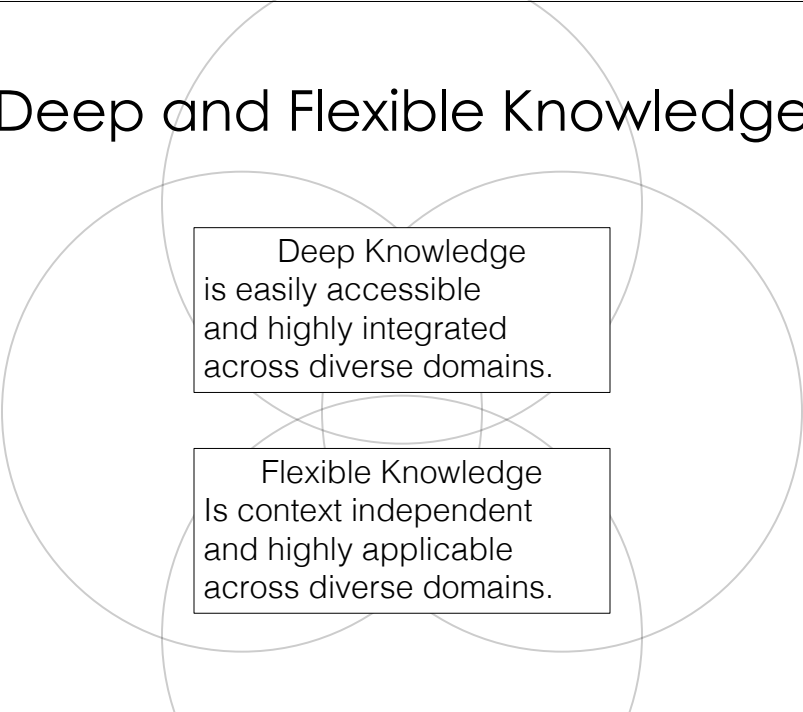


Debrief

- * Processing during learning and performance is improved by having an *awareness* of what one knows, what one can do, and when to apply one's knowledge. [metacognition]
- * Processing during learning and performance is improved by being in *control* of one's knowledge: planning, monitoring, and evaluating. [metacognition]



Deep and Flexible Knowledge



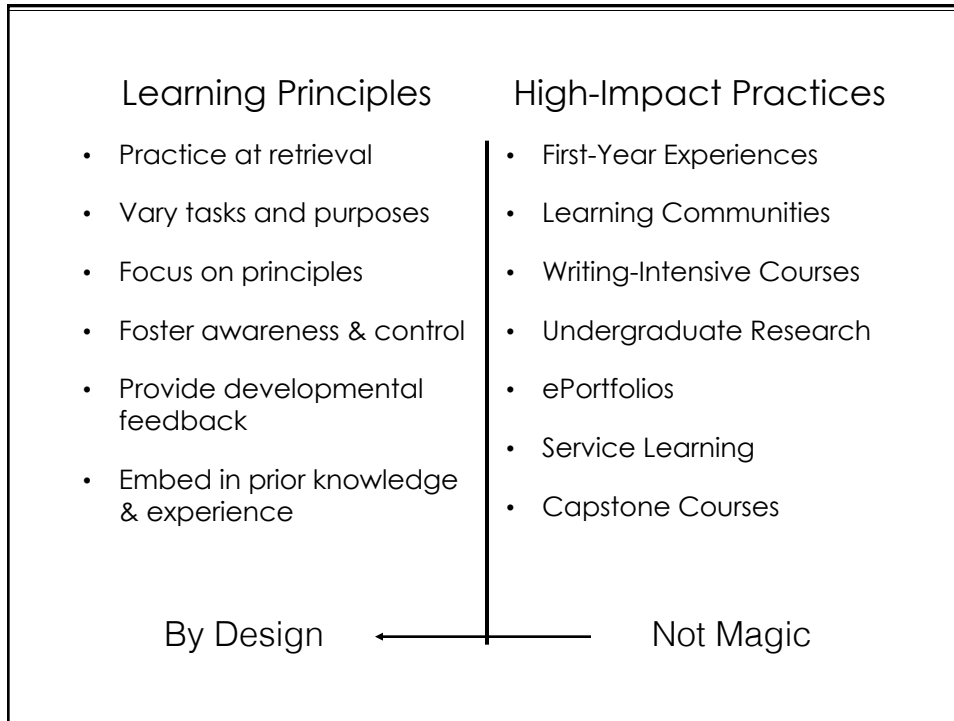
Deep Knowledge
is easily accessible
and highly integrated
across diverse domains.

Flexible Knowledge
Is context independent
and highly applicable
across diverse domains.

6 Principles for Developing Deep and Flexible Knowledge

- Deep 1. Learning through practice at retrieval
- Flexible 2. Learning through varied tasks and purposes
- Deep 3. Learning at the principle level
- Flexible 4. Learning awareness and control (metacognition)
- Deep 5. Learning in response to developmental feedback
- Flexible 6. Learning embedded in prior knowledge & experience

(Engle, 2006; Halpern & Hakel, 2003; Mariano, Doolittle, & Hicks, 2009; Wagner, 2006)

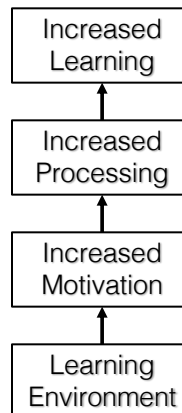


Internal Motivation



7 C's of Motivation

- agency {
1. Choice
 2. Caring (Interest/Value)
 3. Control
 4. Challenge
 5. Collaboration/Connectedness
 6. Competence
 7. Curiosity



(Deci & Ryan, 2000; Gagne & Deci, 2014; Jones et al., 2013; Schunk, Pintrich, & Meece, 2008)

| Learning Principles | UG Research | Motivation Principles |
|-----------------------|------------------------|-----------------------|
| Practice at retrieval | Sustained Involvement | Choice |
| Vary tasks | Clear Expectations | Caring |
| Focus on principles | Intellectual Ownership | Control |
| Awareness & control | Community of Scholars | Challenge |
| Dev feedback | Peer Mentoring | Collaboration |
| Prior know & exp | Cross-Disciplinary | Competence |
| | Faculty Mentoring | Curiosity |

Rowlett, R. et al. (2012). Characteristics of excellence in undergraduate research. In Nancy Hensel (Ed.), *Characteristics in Undergraduate Research*. Washington, DC: Council of Undergraduate Research

Memory and Multitasking



MT →

Multitasking Research

↑ MT with laptop → ↓ retention & class performance

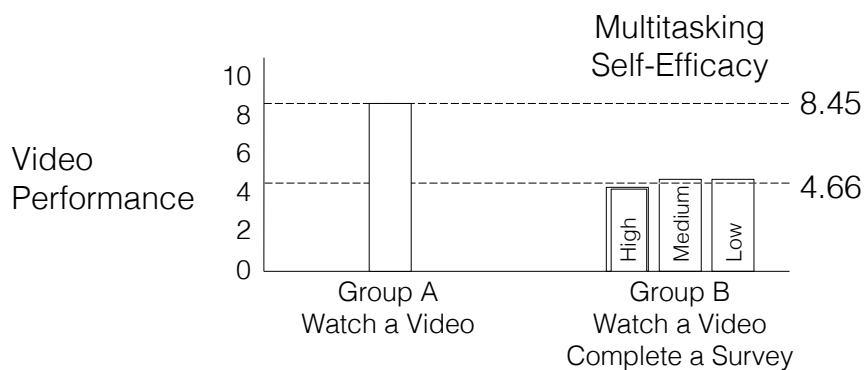
↑ MT while studying → ↓ class performance

↑ laptop MT → ↓ performance by multitasker (11 %)

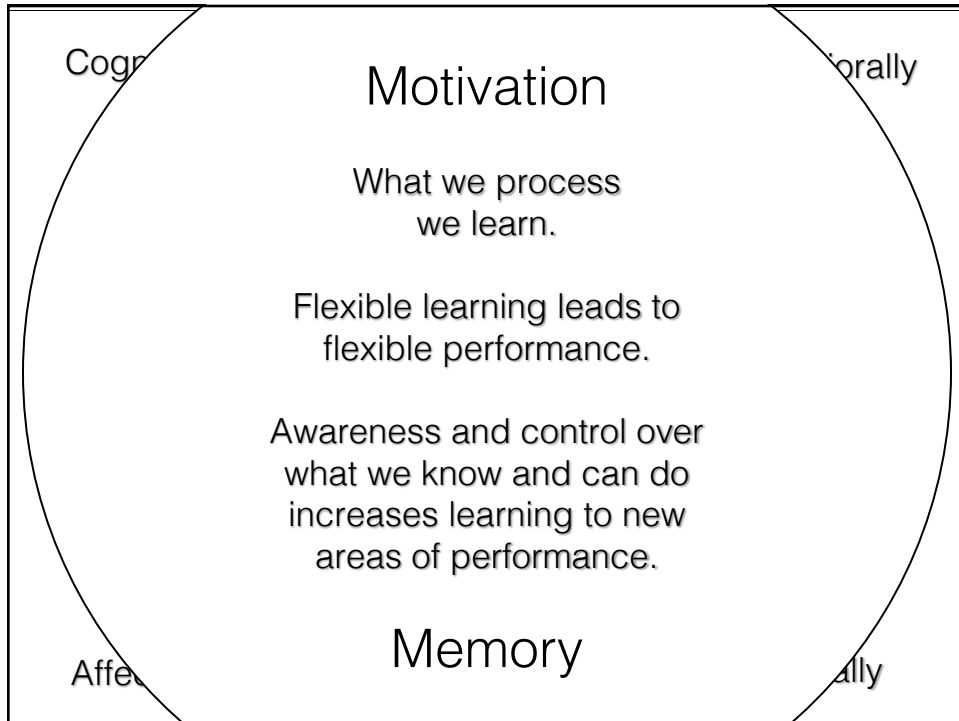
↑ laptop MT → ↓ performance by nearby peers (17 %)


(Judd, 2013; Junco & Cotton, 2011; Sana, Weston, & Cepeda, 2012; Wu, 2017; Zhang, 2015)

Multitasking: Self-Efficacy



Doolittle, Terry, Watson, & Adams (2018)




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