



Active Learning

Experience ▸ Knowledge ▸ Meaning



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I R A C D A

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Hello

Community over Content



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Agenda

Active Learning
to
Proactive Teaching

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Anticipation Guide

Directions: For each of the following 3 sentences,

- Agree
- Disagree
- Edit into agreement

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Anticipation Guide

1. Active learning involves students doing things and thinking about the things they are doing.
2. Active learning-based classes result in more student learning than lecture-based classes.
3. Active learning fosters greater learning in small STEM classes focused on problem solving.

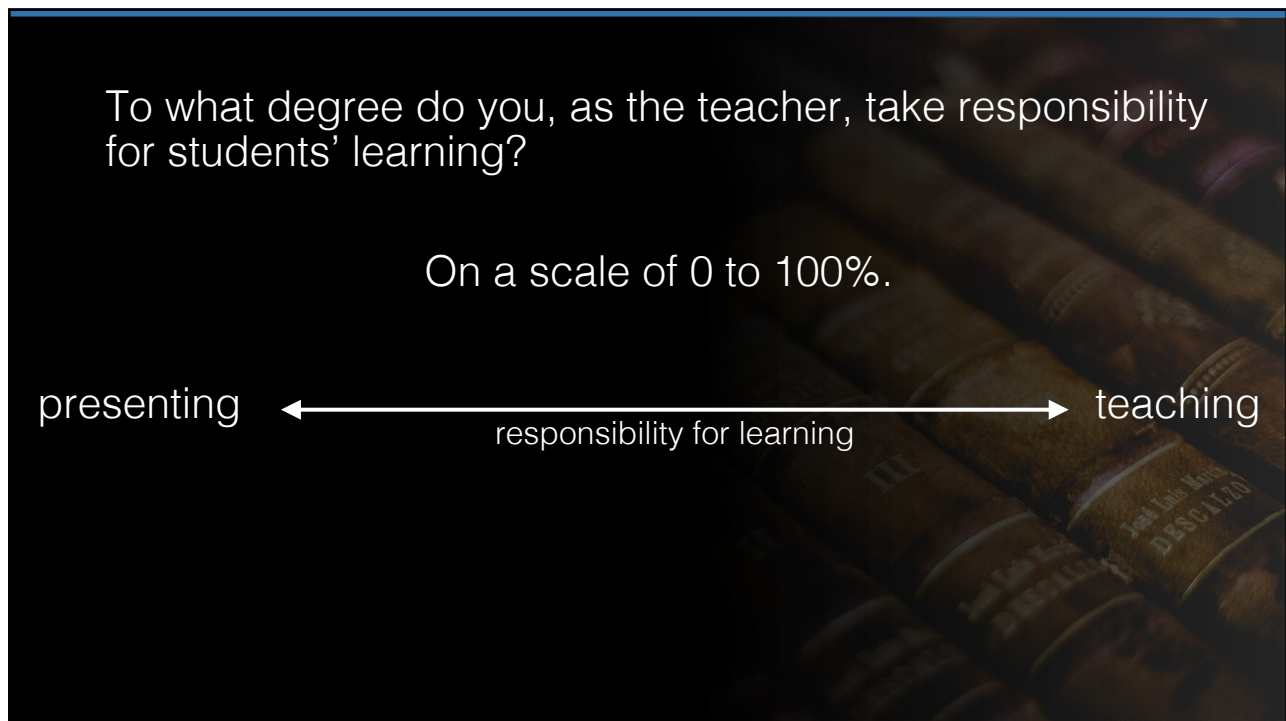
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A Change in Perspective

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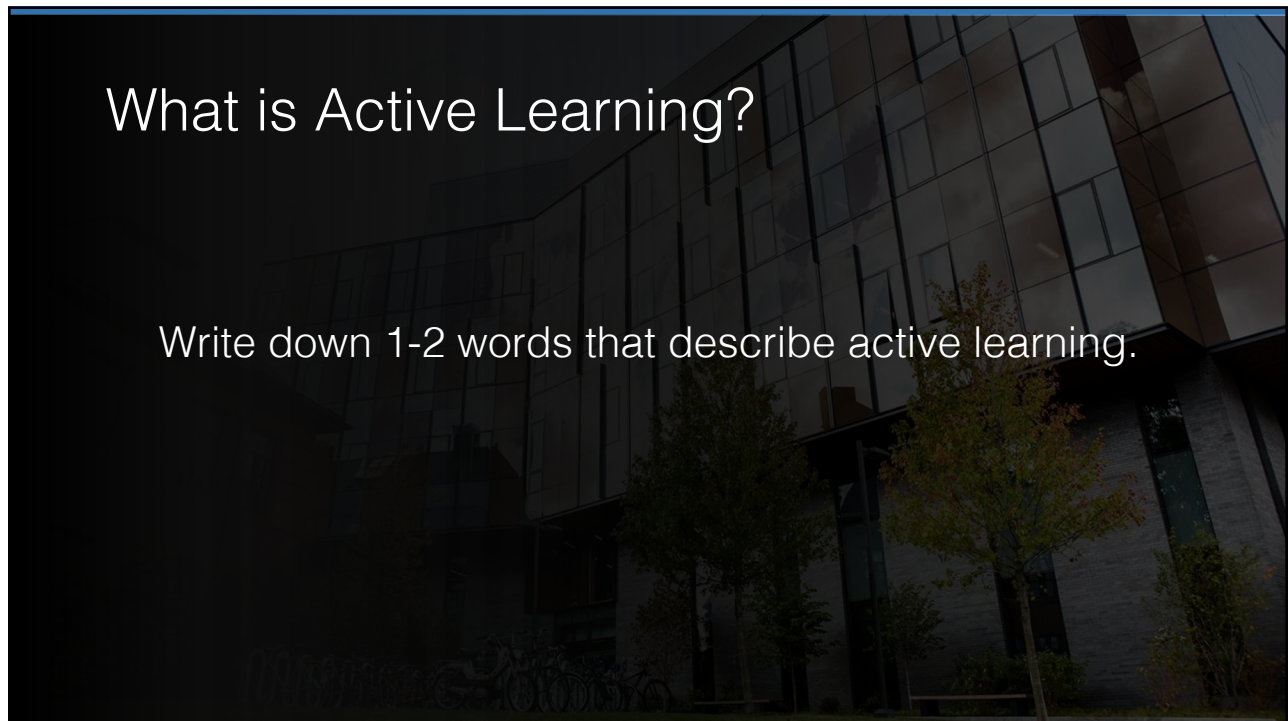
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What is Active Learning?

Freeman et al. (2014)

Active Learning vs Lecture Courses
UG STEM Courses
Exam Scores & DFW Rates

- AL → ↑ Exams & ↓ DFWs

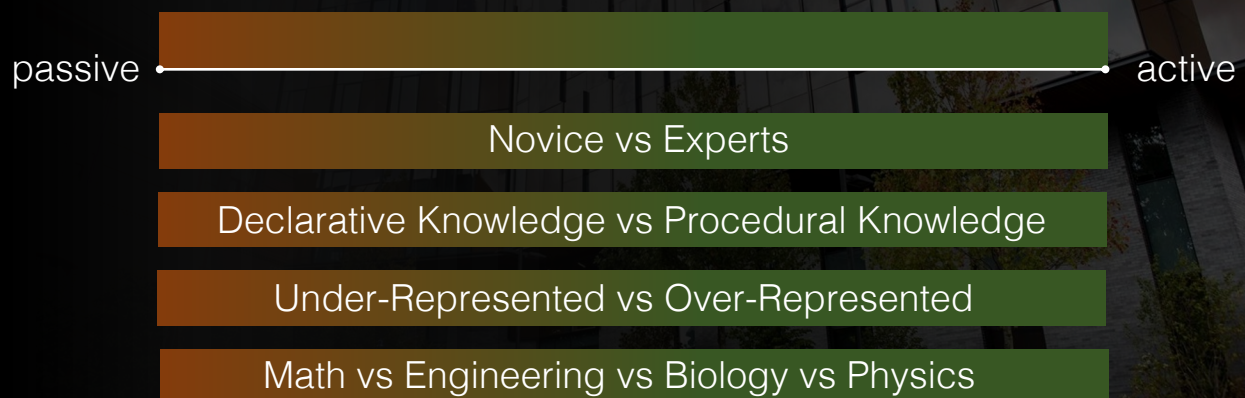
Theobald et al. (2020)

Active Learning vs Lecture Courses
UG STEM Courses
Exam Scores & DFW Rates

- AL → ↑ Exams & ↓ DFWs
- Larger gains for students from underrepresented groups (narrowed achievement gap)

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What is Active Learning?



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Active Learning Research

- ✓ **First Generation** Does Active Learning Work?
- ✗ **Second Generation** For Whom? When? Why? Domains?

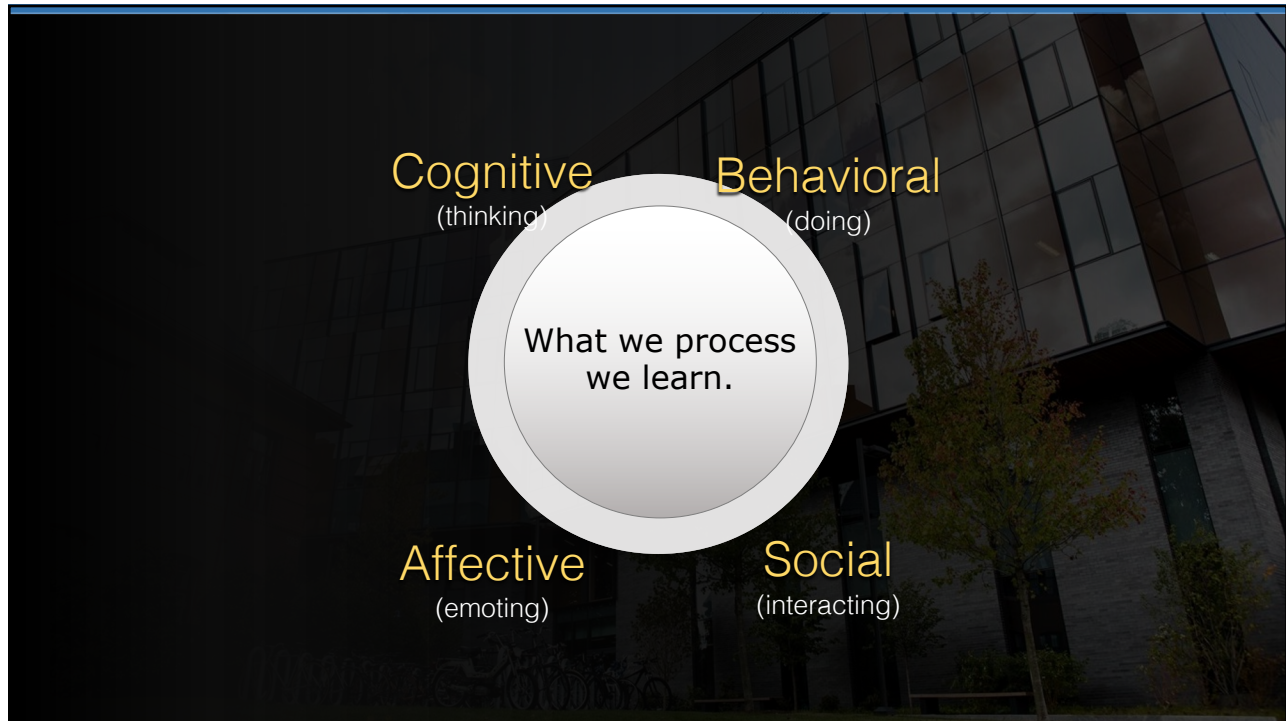
(Bernstein, 2018; Freeman et al., 2014; Streveler & Menekse, 2017)

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What is Active Learning?

Active learning fosters **strong and flexible knowledge** through
cognitive, social, behavioral, and affective **processing**
of one's **knowledge and experience.**

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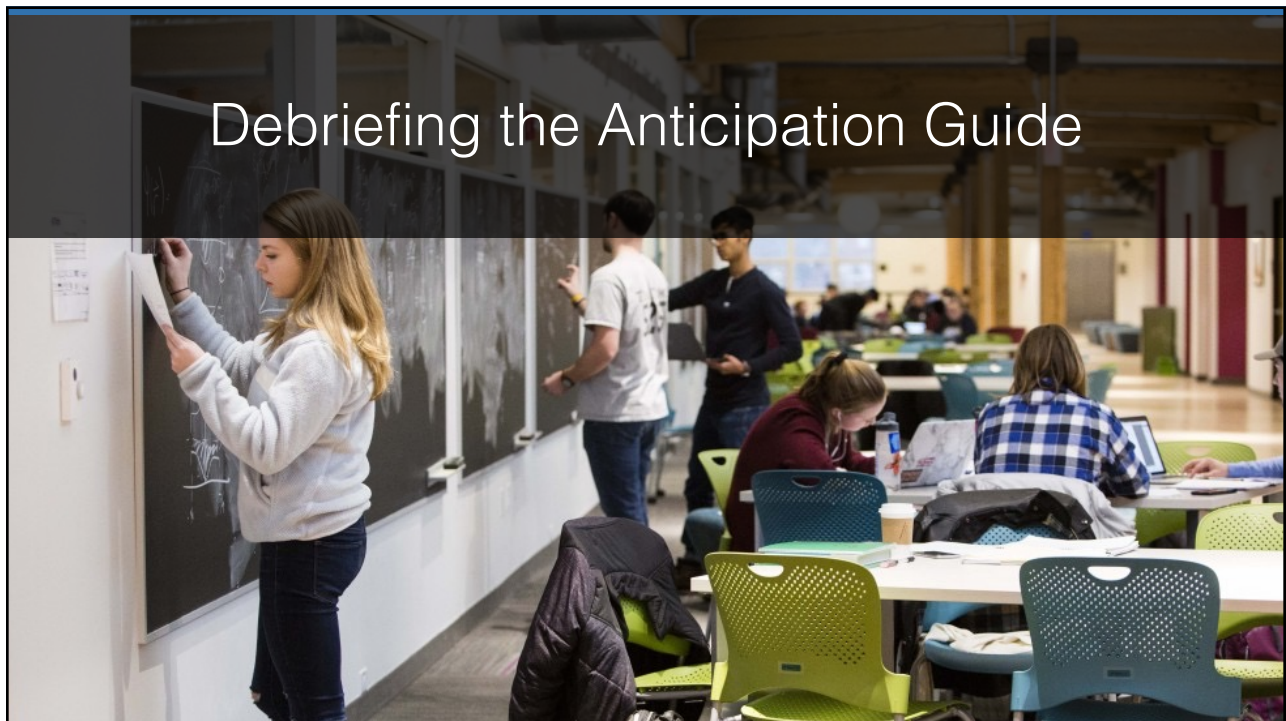
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Active Learning
to
Proactive Teaching

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Debriefing the Anticipation Guide

Directions: For each of the following 3 sentences,

- Agree
- Disagree
- Edit into agreement

1. Active learning involves students doing things and thinking about the things they are doing.
2. Active learning-based classes result in more student learning than lecture-based classes.
3. Active learning fosters greater learning in small STEM classes focused on problem solving.

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Debriefing the Anticipation Guide



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Debriefing the Anticipation Guide

The first few minutes in class



dictate the remaining minutes in class.

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Debriefing the Anticipation Guide

Activation Activation results in an increased level of stimulation of students' prior knowledge.

Priming Activated prior knowledge is more readily accessible for immediate processing.

Spread of Activation Activated prior knowledge increases the activation of closely related knowledge.

(Collins & Luftus, 1975; Grolbb-Mylnek et al.,2020; Schlosberg, 1954; Yerkes & Dodson, 1908)

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active • learn • student • class

(Collins & Luftus, 1975; Grolbb-Mylnek et al.,2020; Schlosberg, 1954; Yerkes & Dodson, 1908)

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Debriefing the Anticipation Guide

Activation

Priming

Spread of
Activation

Activate Relevant Prior Knowledge

- Use Production-based Activities, NOT Reception-based Activities
- Solve, answer, explain, discuss, apply

(Collins & Luftus, 1975; Grolbb-Mylnek et al.,2020; Schlosberg, 1954; Yerkes & Dodson, 1908)

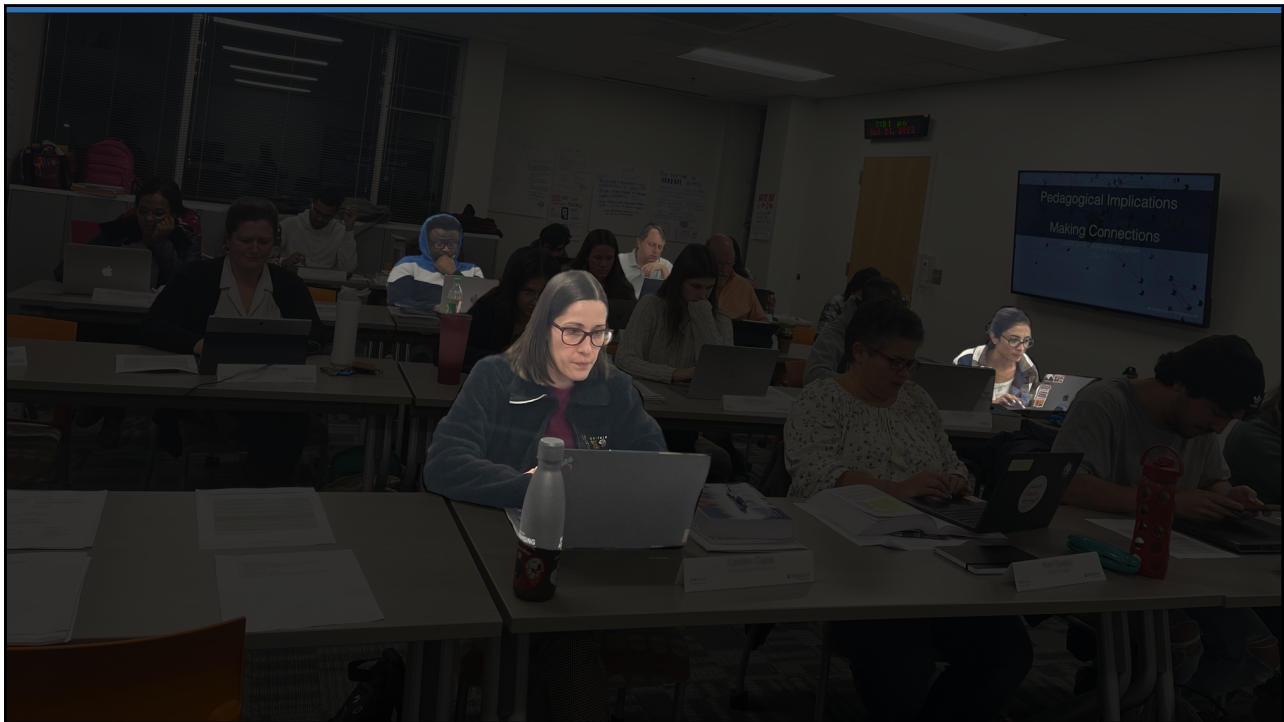
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Debriefing the Anticipation Guide

1 Minute Free Write

What do you see?

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Debriefing the Anticipation Guide

The first few minutes in class



dictate the remaining minutes in class.

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Start Each Class with a Routine (5-15 min)

1. Hello
2. Priming Activity
3. Debrief End-of-Class Evaluation
4. Any Questions?
5. Review (Production, NOT Reception)

Introduction

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End Each Class with a Routine (5-15 min)

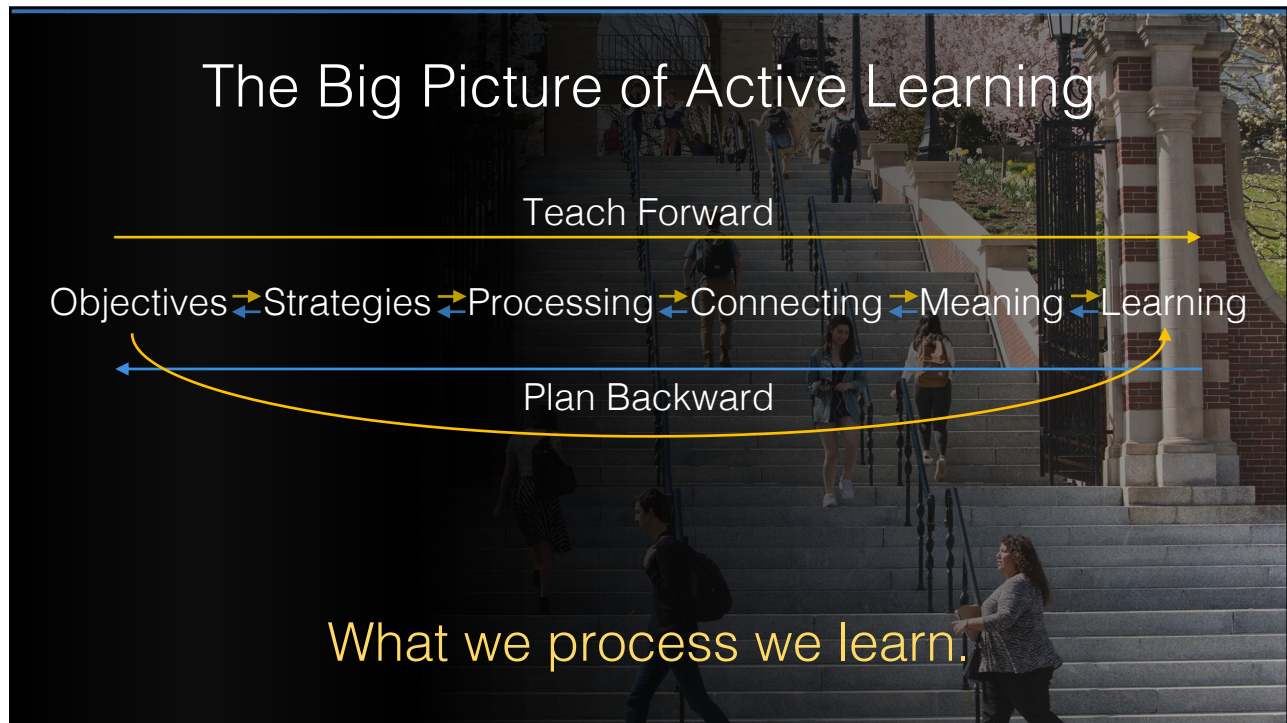
1. Recall or apply the relevant content/skills
2. End-of-Class Evaluation (reflection & feedback)
 - What aspects of the class are confusing?
 - What elements of the instruction were effective?
 - Comments/Thoughts?
3. Bye!

Closure

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Meaning & Learning: Experiment

Directions . . .

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Words
What do these results tell us about learning?

Rest Snore Sound
Tired ~~Sleep~~ Comfort
Awake That's all! Wake
Dream Slumber Night

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Meaning & Learning

Conclusions

1. Connecting Fosters Meaning
2. Meaning Fosters Learning
3. Memory is Organized
4. Memory Imposes Limits

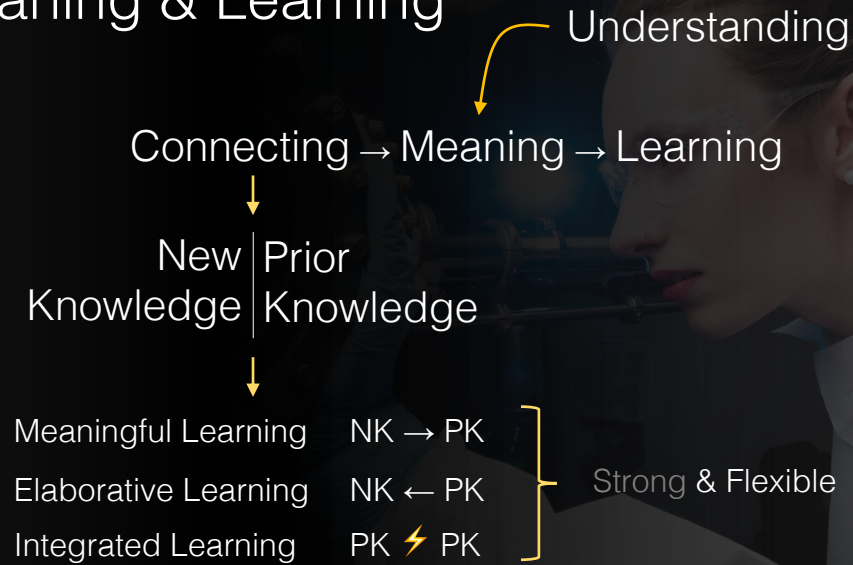
Rest	Snore	Sound
Tired	Bed	Comfort
Awake	Eat	Wake
Dream	Slumber	Night

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sRtse	Ssnore	Sfouarnd
tuitseach	lEada	Comfotnd
dúAwaket	iEae	Wiskgh
Dseagn	Slpithber	Niighte

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Meaning & Learning



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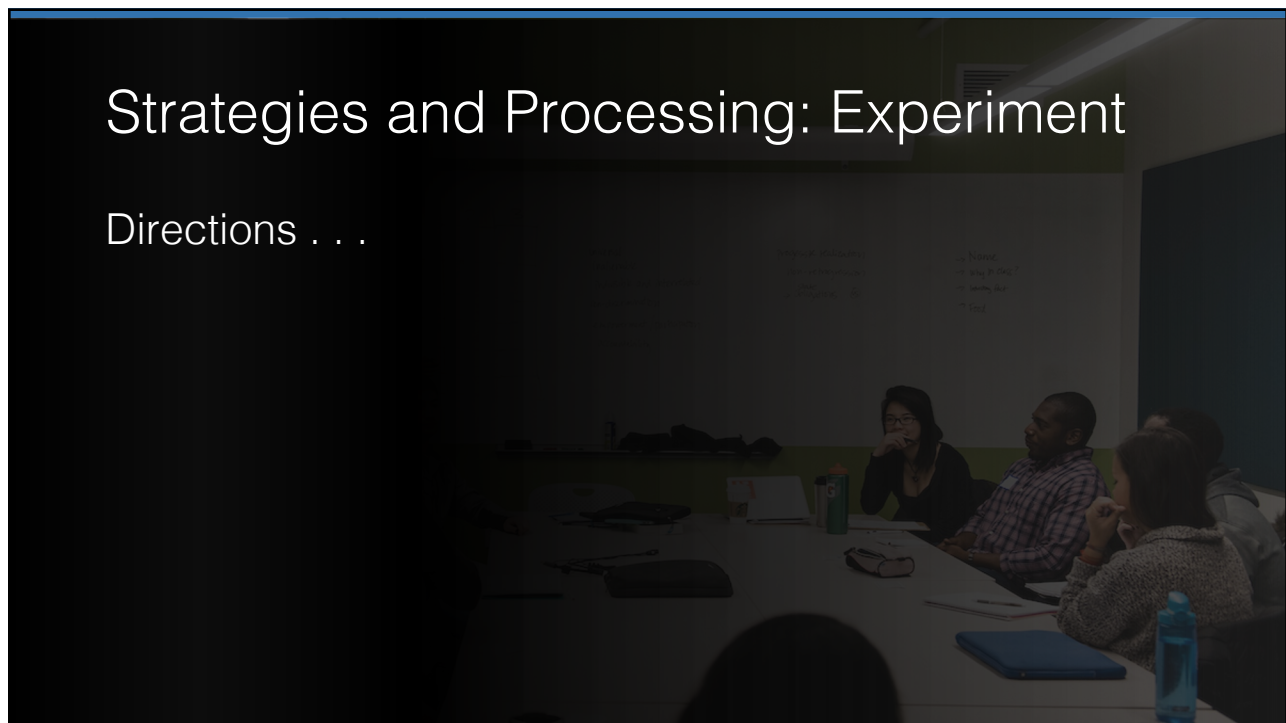
Make Some Meaning

Write a 1-sentence summary of this
Meaning & Memory section.

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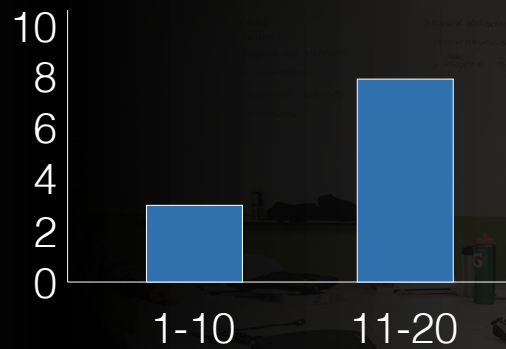
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Strategies and Processing

What do these results tell us about learning?

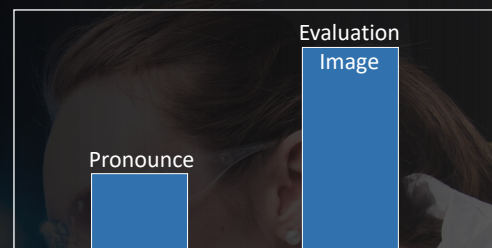


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Strategies & Processing

Conclusions

1. Strategies Foster Processing
2. Processing Fosters Connecting
3. Connecting Fosters Meaning
4. Meaning Fosters Learning
5. Memory is Organized
6. Memory Imposes Limits



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Strategies and Processing

Strategies → Processing → Connecting → Meaning → Learning

↓
Cognitive → Thinking

Behavioral → Doing

Social → Interacting

Affective → Feeling

How do we foster "connection"?
What we process we learn.

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Strategies and Processing

Strategies → Processing → Connecting → Meaning → Learning

↓
Cognitive → 1. Retrieval Effect

Behavioral → 2. Generation Effect

Social → 3. Spacing Effect

Affective

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Strategies and Processing

Strategies → Processing → Connection

- Lecture
- Hands On
- Discussions
- Creating Apps
- Think – Pair – Share
- Small Group Problem Solving
- Write a summary (in your own words)



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PROCESSING

Think-Pair-Share
Anticipation Guide

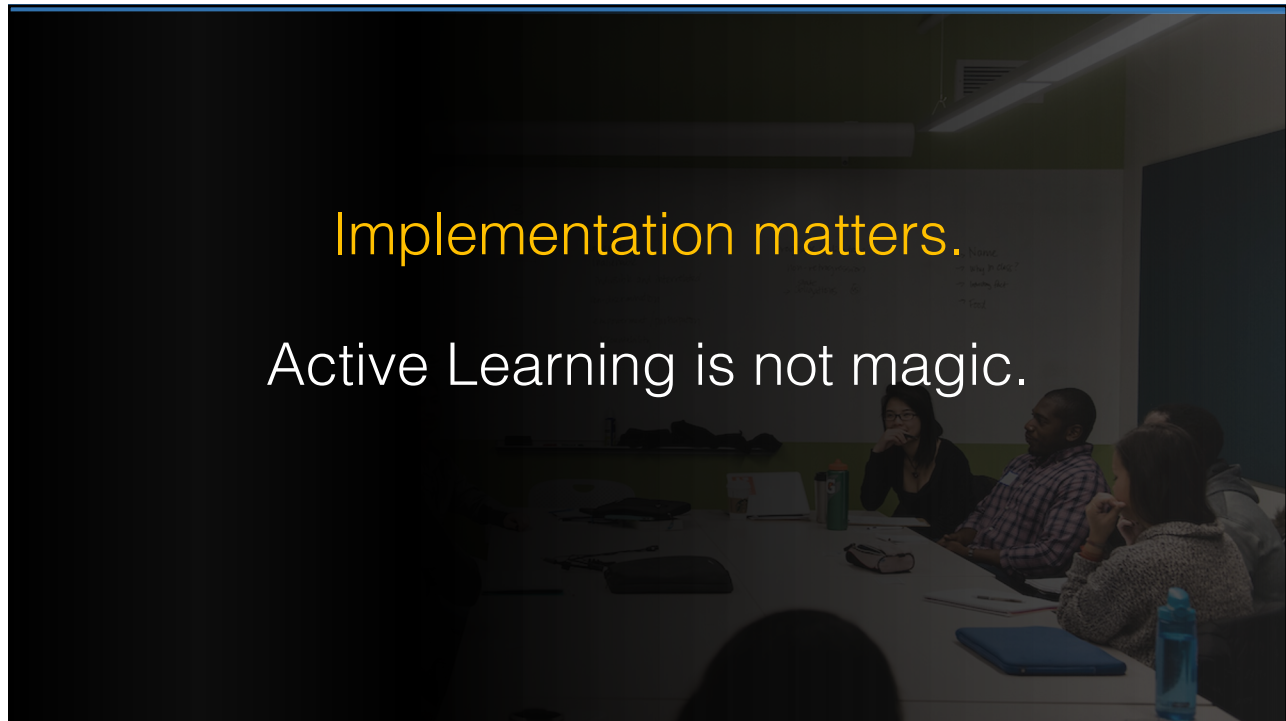
Retrieved Relevant Prior Knowledge
Made Meaning of the Statement
Evaluated the Statement
Edited the Statement, as Needed
Indicated the Judgement

Retrieved Previous Judgement & Rationale
Organized an Explanation
Expressed the Explanation
Read Your Colleague for Understanding
Re-Generate a Response & Re-Express

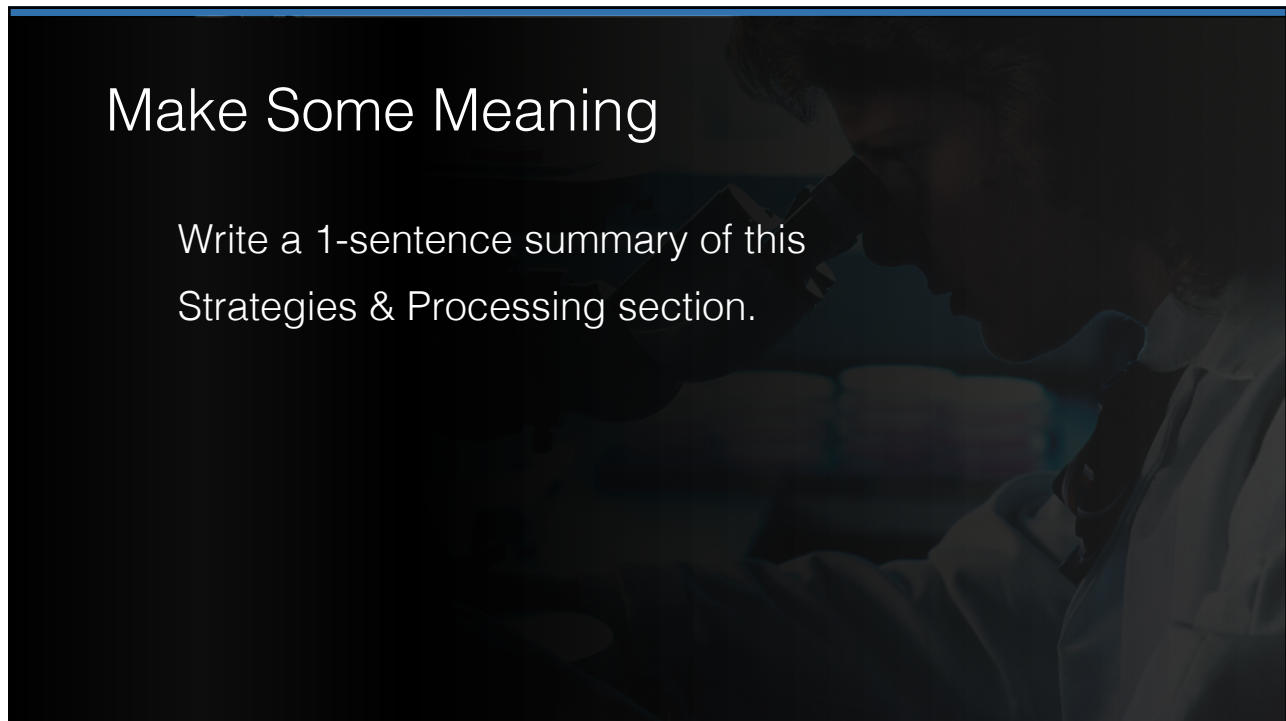
Listen to Other's Response
Make Meaning of their Response
Ask Questions, as Needed
Compare Self and Other's Meanings
Generate Response and Respond

Meaning
Learning

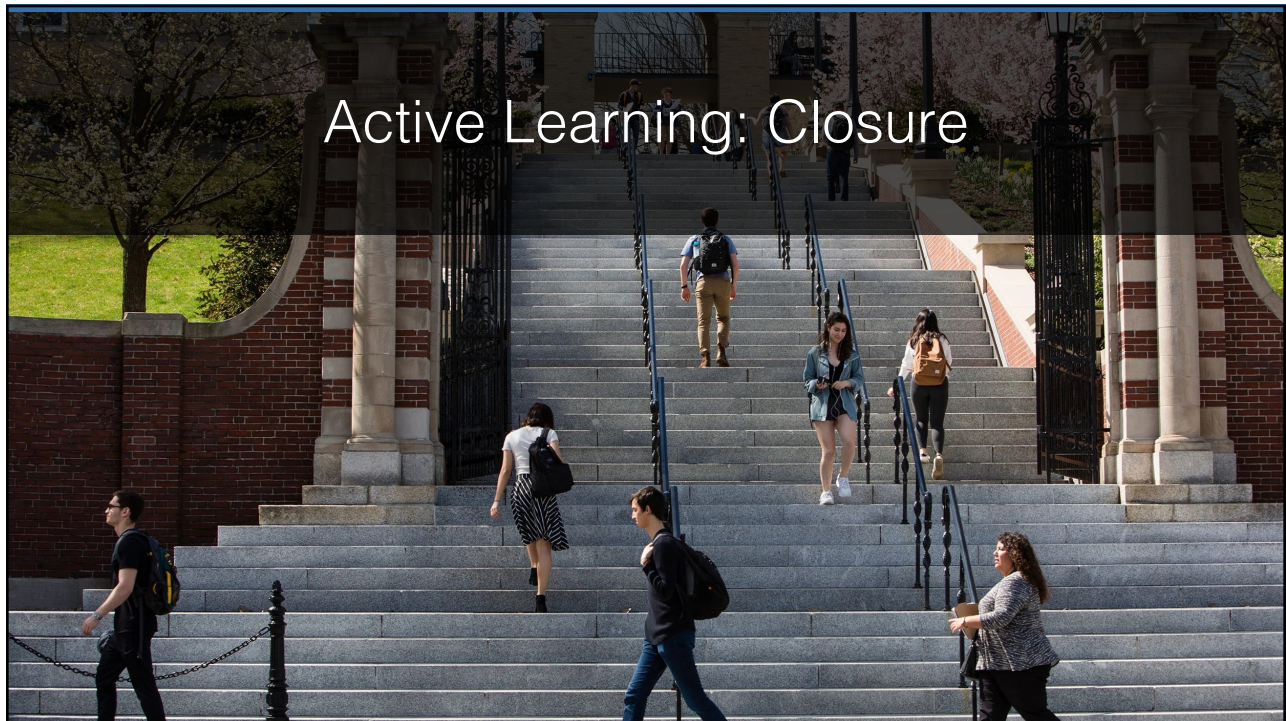
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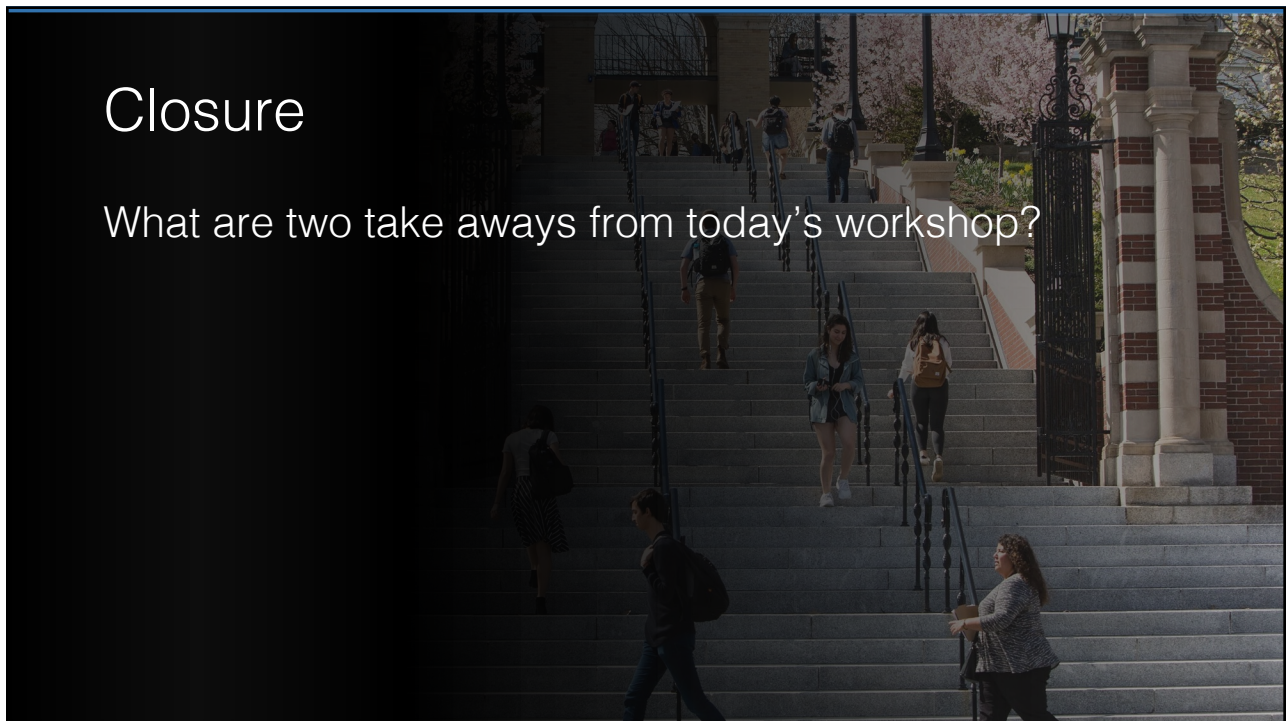
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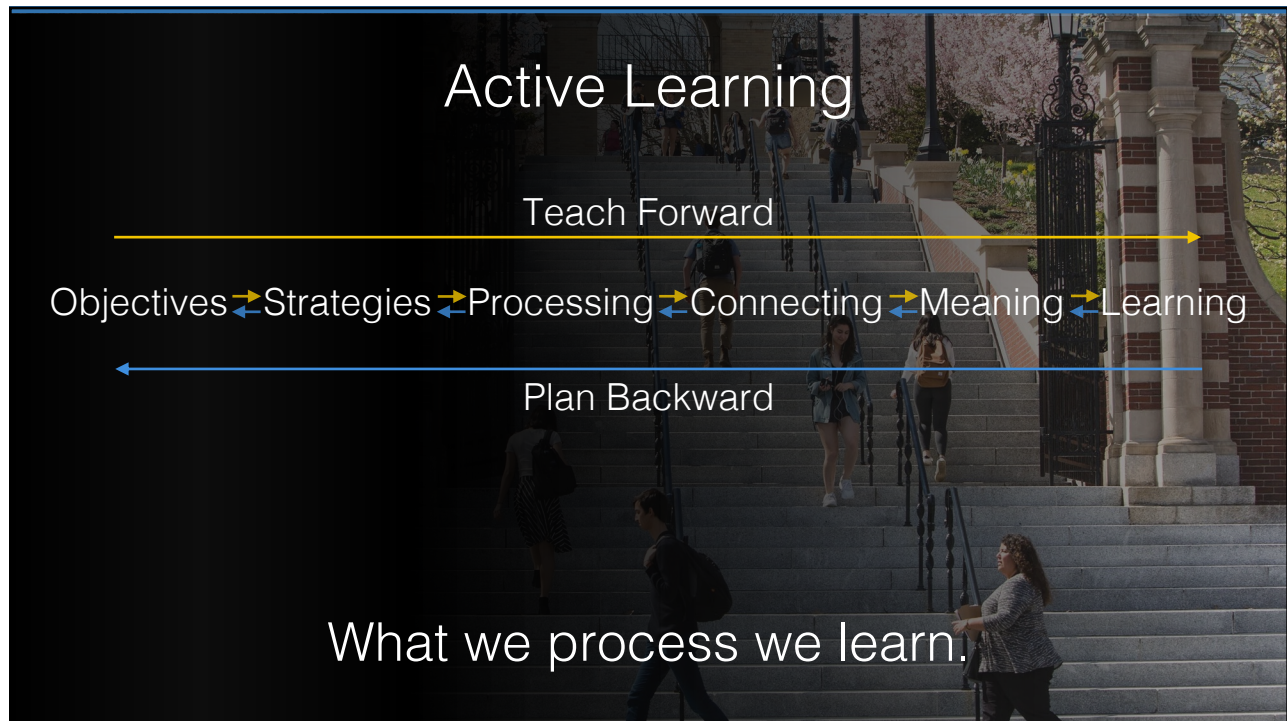
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This slide features a dark blue background on the left and a photograph of a modern university building's interior on the right. The photograph shows a multi-story atrium with a red brick building in the background and a white staircase in the foreground. The text 'Active Learning' is prominently displayed in white on the dark blue background. Below it, the phrase 'Experience ▸ Knowledge ▸ Meaning' is written in a smaller white font. In the top left corner, the Tufts University logo is visible. In the bottom left corner, the name 'Peter Doolittle' is listed along with his affiliation 'Educational Psychology, Virginia Tech' and email 'pdoo@vt.edu'. In the bottom right corner, the text 'Institutional Research and Academic Career Development Workshop' is displayed in a blue font over the photograph.

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