



# Center for Excellence and Innovation in Teaching and Learning

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*The Student Cognition Toolbox:  
Promote Student Success by Empowering Them to  
Become Self-Regulated Learners in Any  
Course Delivery Platform*

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Talk about Teaching

July 7, 2020

# Acknowledgments

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# Agenda

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- How do your students currently study?
- Choosing a Cognitively-based study strategy
- Student Cognition Toolbox
- Implementation Examples
- Wrap Up

# HOW DO STUDENTS STUDY?

What the  
research says  
The SBI

# How Students Study

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Miyatsu, Nguyen, & McDaniel (2018). Five popular study strategies, *Perspectives on Psychological Science*, 13, 390–407

Re-reading

• 78%

Highlighting  
and  
Underlining

• 53%

Note-taking

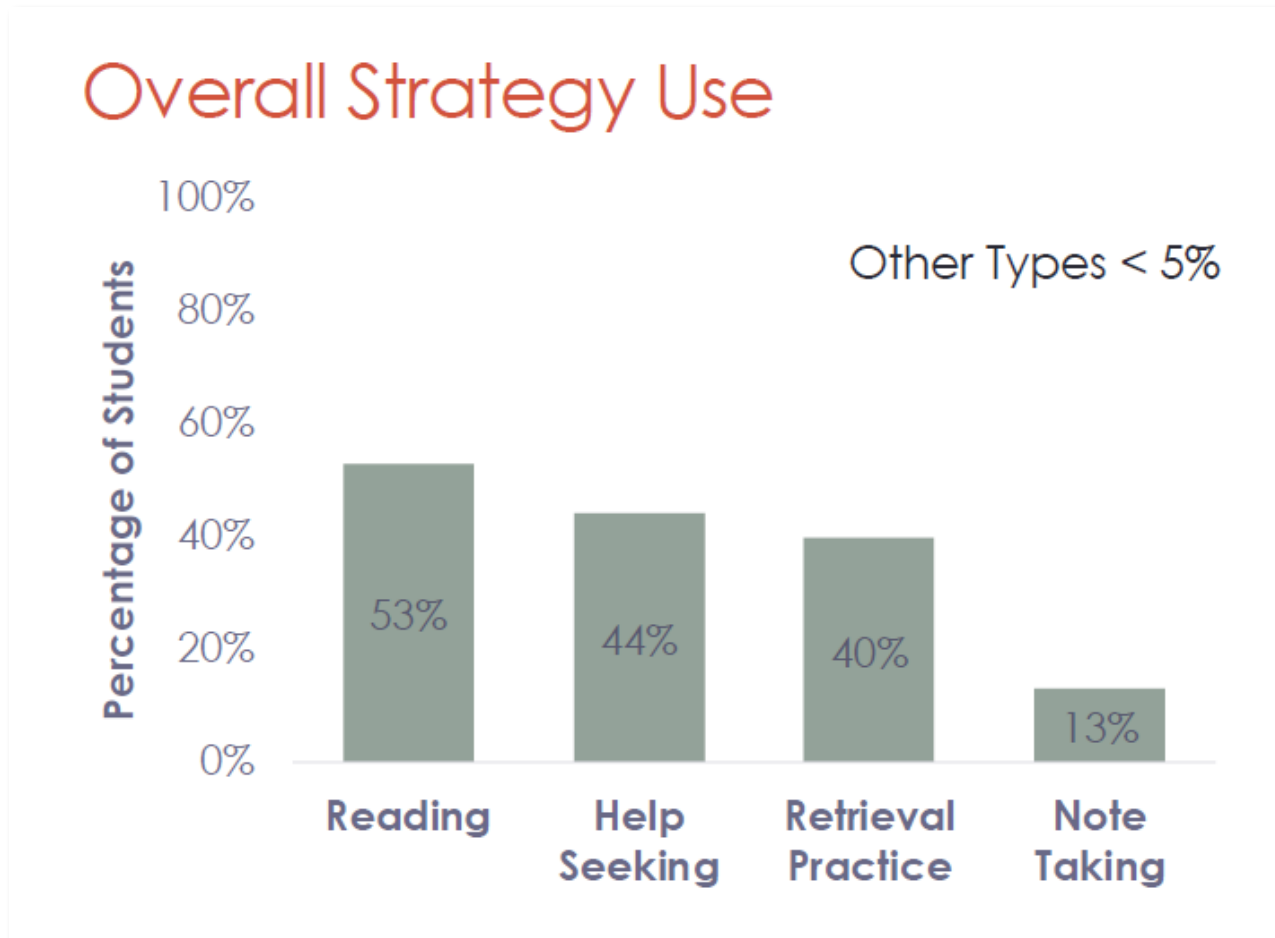
• 30%

Using Flash  
Cards

• 53%

# Understanding Normative Educational Practices Can Inform Innovation in STEM Learning

Butler (2018)



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# THE STUDY BEHAVIOR INVENTORY

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# Deep

I space out my study sessions in the time leading up to the exam

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I relate what I am reading for the course to classroom sessions

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I test myself on course materials without referring to my course materials or notes, etc.

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I plan effectively for study time between classes

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I summarize in my own words information I learn from my study

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I explain concepts to a classmate/friend

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I create outlines, charts, diagrams, or tables, etc., to organize and help me see patterns in course information

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## Shallow

I ask a classmate/friend to help me understand course material

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I focus most of my studying to the time just prior to an exam

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I ask my professor or TA to help me understand course materials

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I read the required course materials more than once

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I highlight and/or underline the most important information in my reading

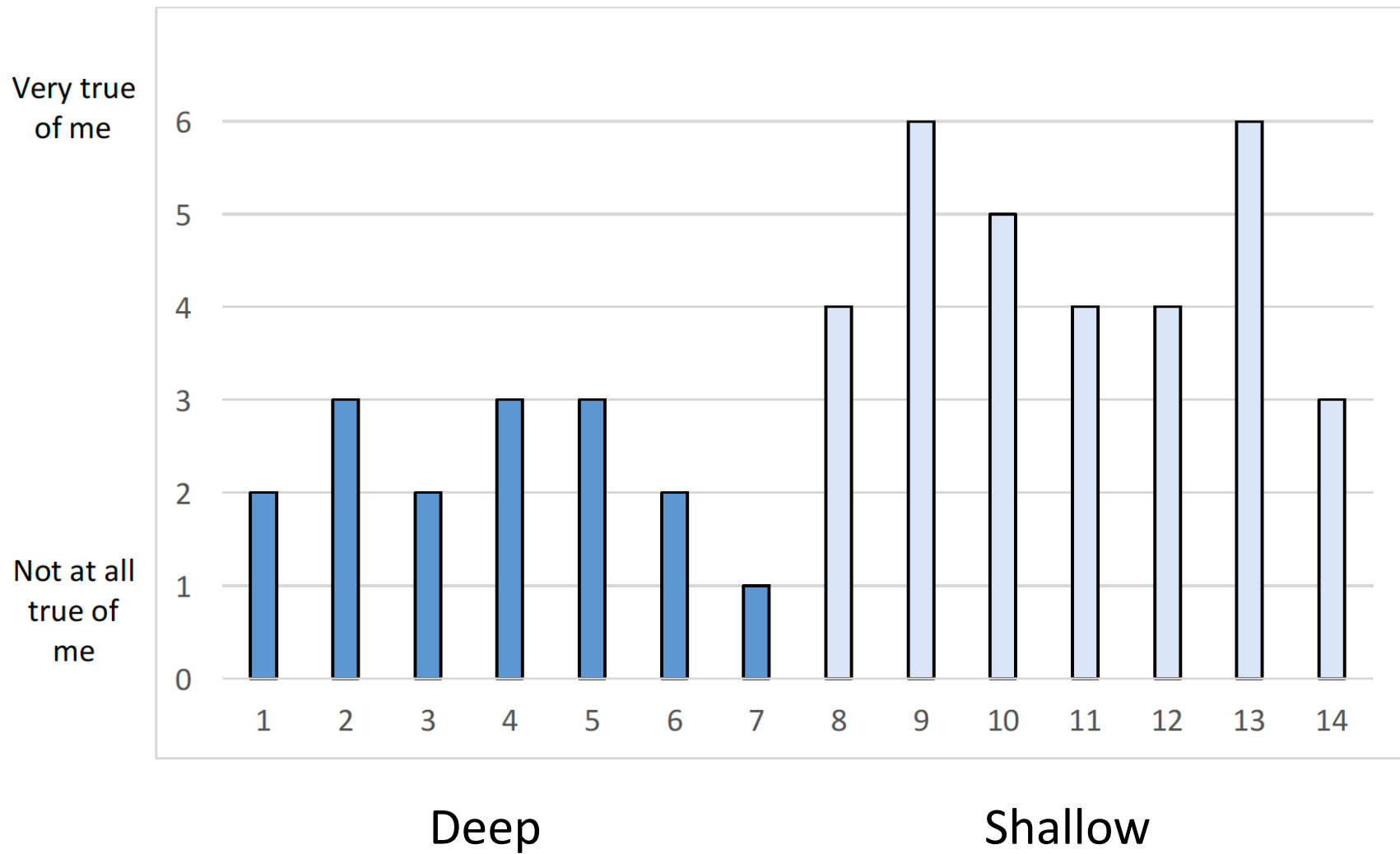
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I take care to organize my lecture notes

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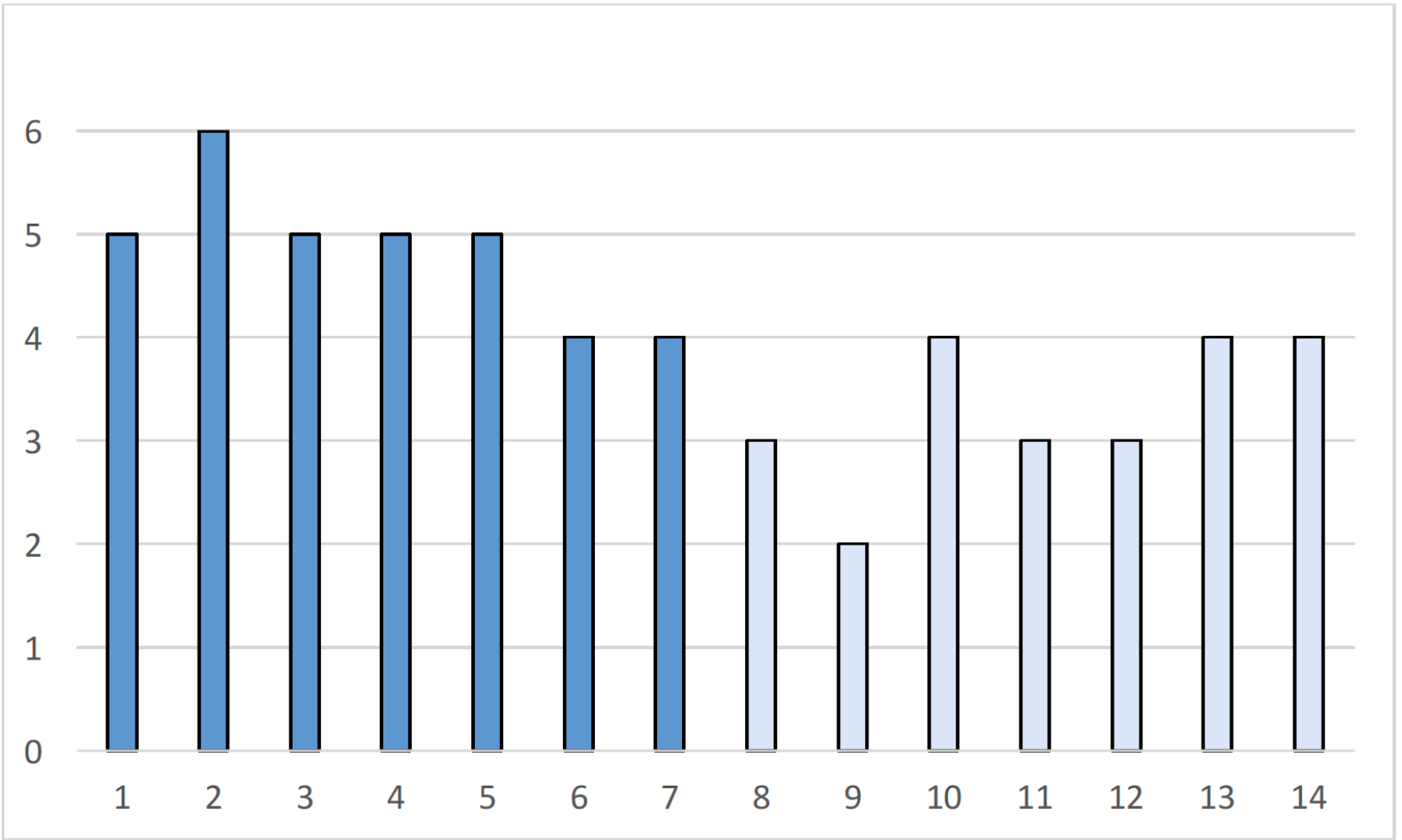
I try to learn the more difficult material first, when time is limited prior to an exam

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Very true  
of me

Not at all  
true of  
me

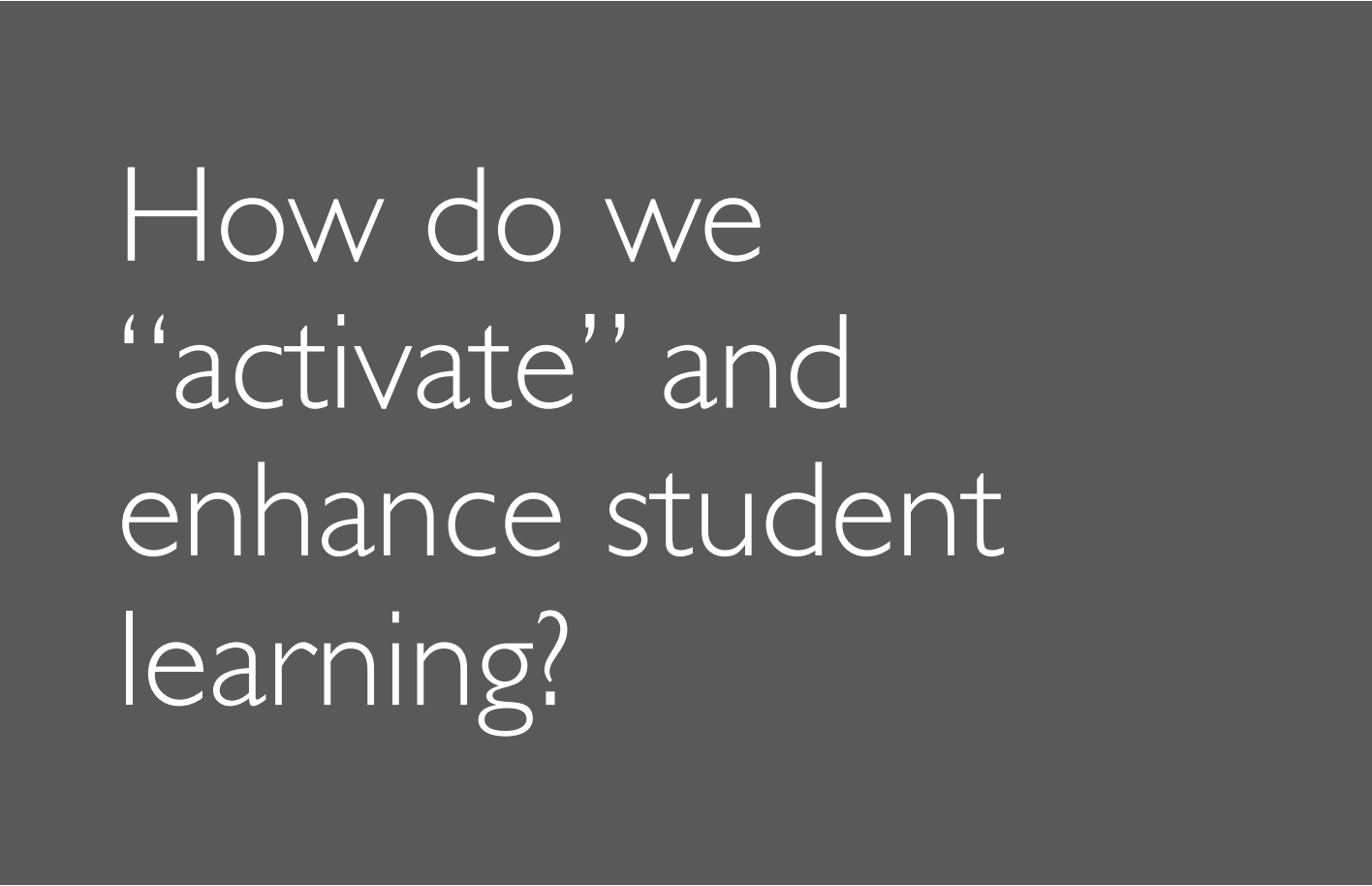


Deep

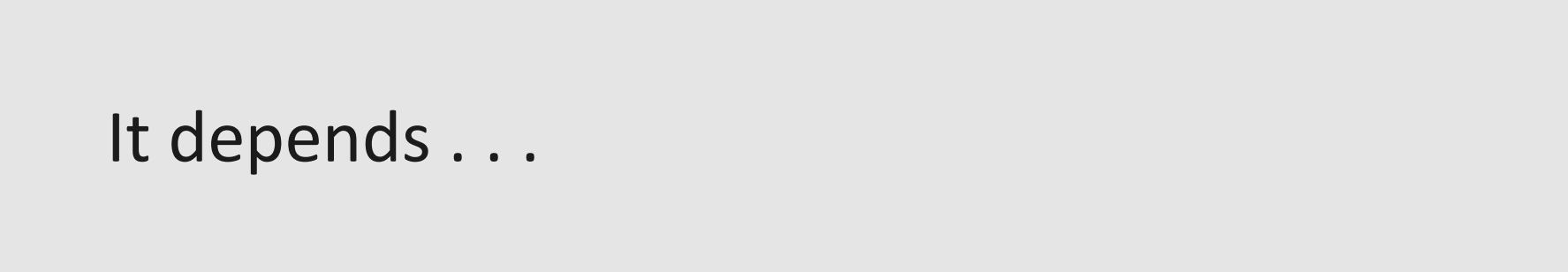
Shallow

# CHOOSING A COGNITIVELY- BASED STUDY STRATEGY

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How do we  
“activate” and  
enhance student  
learning?



It depends . . .

# It Depends?

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What kind of knowledge does your student need to attain?

- Facts?
- Concepts?
- Principles?

What kind of learning processes is required for your student's learning objective?

- Learn facts and associations?
- Learning rules, classifications, and categories?
- Learn principles, sense making, and deep comprehension?

What kind of study strategy will you recommend and use to promote learning your objectives?

- Quizzing?
- Self-explanation?
- Elaborative interrogation?



# GENERAL SCT MODULE TEMPLATE

## Study Behavior Inventory (pre)

### Part 1: Engagement in the learning activity


- Exposure of material to be learned
- Utilization of learning strategy during reading

### Part 2: Study Skills Lesson

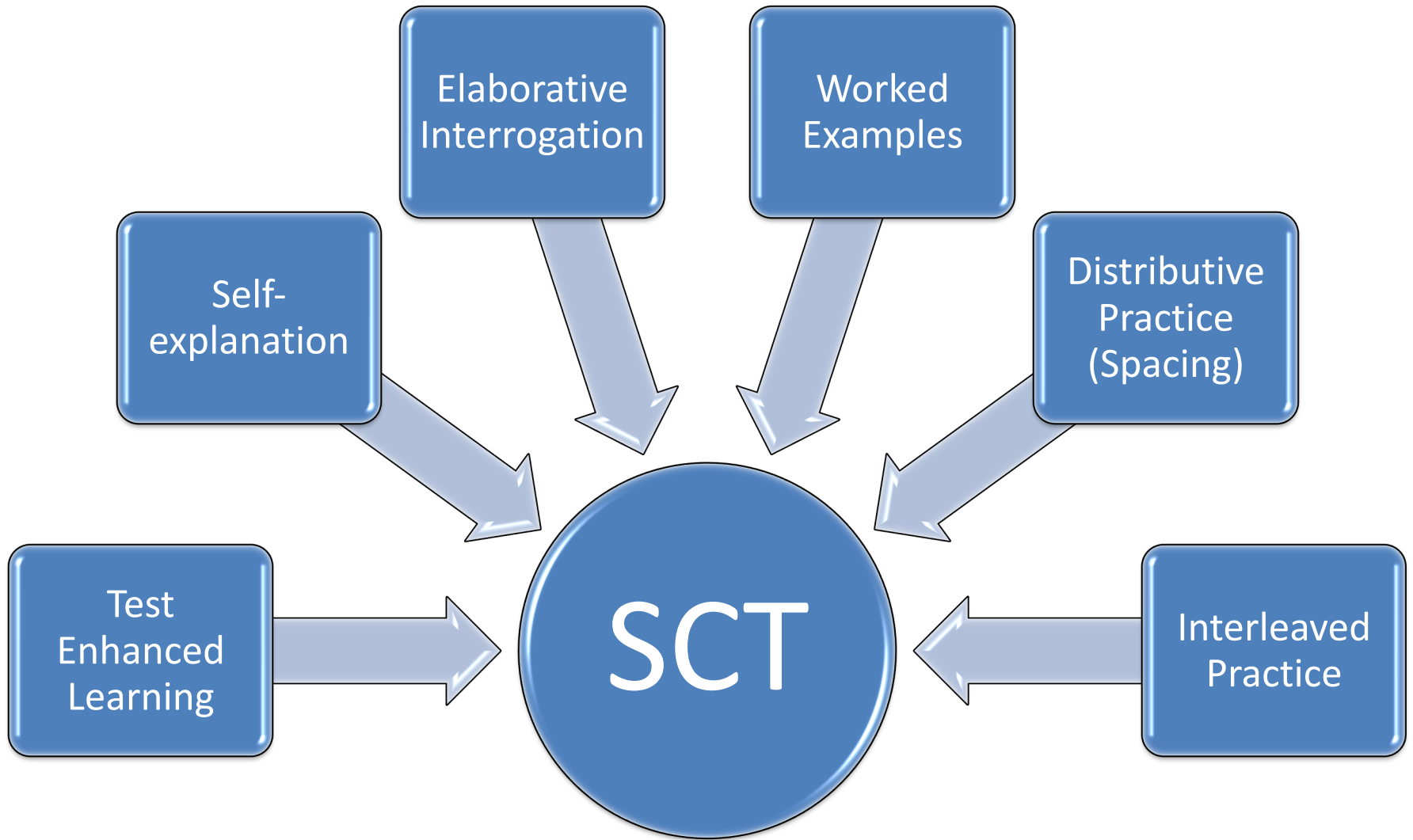
- Exposure to presentation on the study strategy
- Practice using strategy in a variety of contexts
- Assessment of how well they learned the study strategy

## Study Behavior Inventory (post)



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STUDENT  
COGNITION  
TOOLBOX STUDY  
STRATEGIES



# Fall 2019 and Spring 2020

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~2000 UNH students from a variety of courses

Biology

Chemistry

Psychology

Statistics

Cybersecurity

Nursing

Body Fluids

PLTL Leaders

Political Science

First-year Writing

Mythology

Animal Health

US Health Care Systems

Weather

Phlebotomy

Earth Sciences

# Fall 2019 and Spring 2020

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- Provide course credit!
- Assessment plans
  - general student feedback (reflection questions)
  - module effectiveness
    - Pre and Post SBI
    - SCT CheckPoint Quizzes
    - Course Exam Scores
    - Data Analytics

# The Student Cognition Toolbox


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**Carnegie Mellon University**



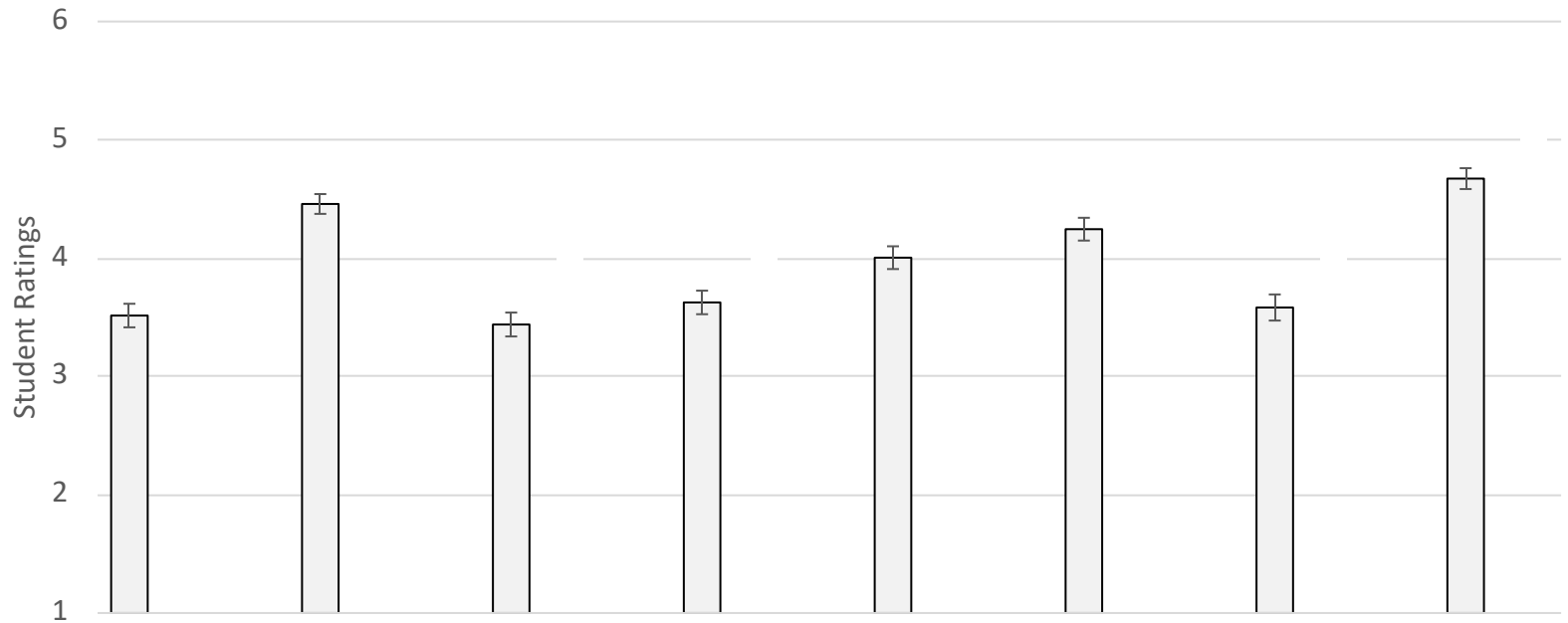
**Open Learning Initiative**

Transforming higher education through the science of learning.



**THE SBI:  
PRE AND POST  
DEEP PROCESSING**

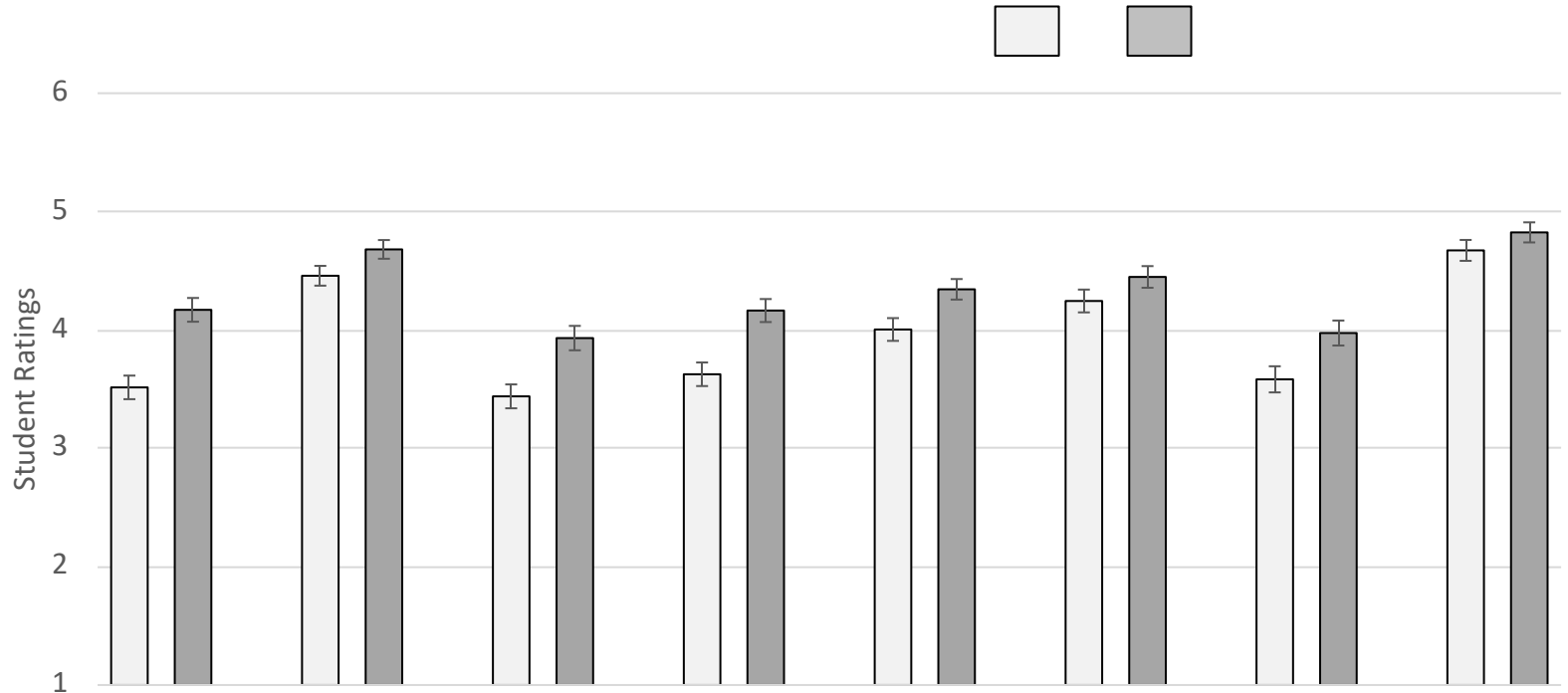
# Study behavior Inventory Deep Processing Responses Pre and Post SCT



I space out my study sessions...  
I relate what I am currently...  
I test myself on course...  
I plan effectively for study time...  
I summarize in my own words...  
I explain concepts to myself...  
I create outlines, charts, ...  
When I am learning to solve...

Error Bars 95% CI

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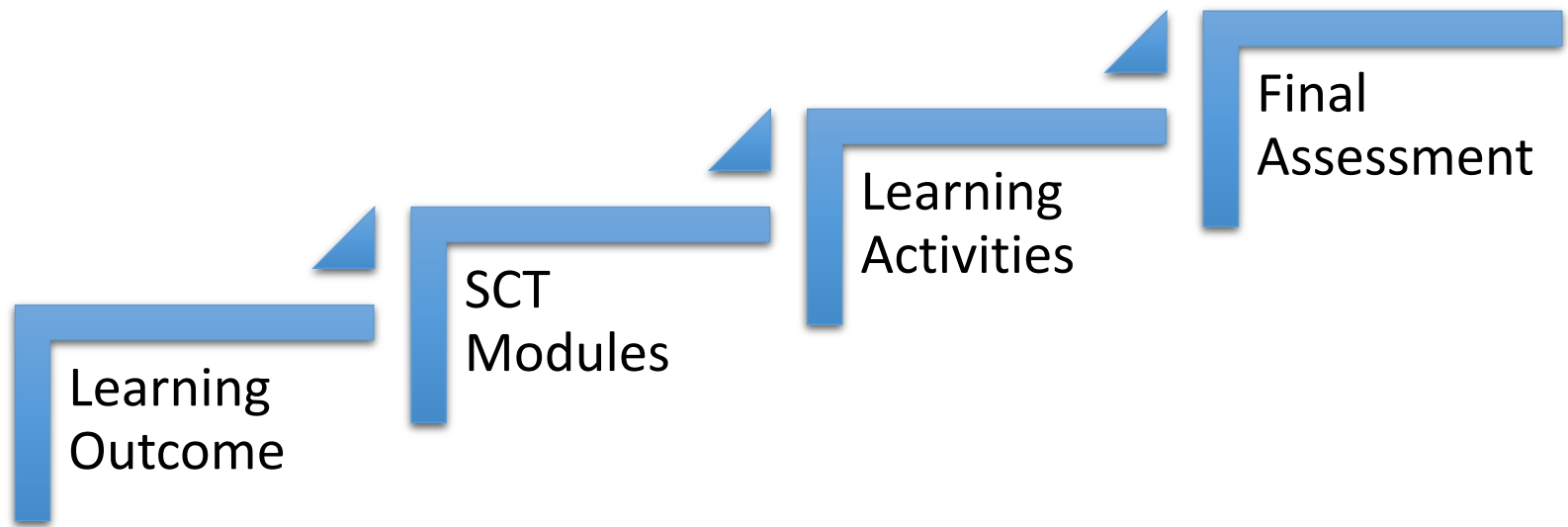
Error Bars 95% CI



# Implementation Model

- Decide on your course learning outcomes
- Assign SCT modules that address those outcomes
- At beginning of term, students complete introductory module, the modules that address your learning outcomes, and final module
- Give course 'homework' assignments that include use of skills learned in SCT
- Include final assessments that tap your learning outcomes

# Course: Introductory Statistics



# Wrap Up

- Review the SCT in depth?
- Use the SCT in a course you will be teaching this fall term?
- If interested, contact Lauren Kordonowy at CEITL: [Lauren.Kordonowy@unh.edu](mailto:Lauren.Kordonowy@unh.edu)