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

Catherine Overson (PI)
Victor Benassi (Co-PI)
SCT Team:
  Lauren Kordonowy
  Jennifer Calawa
  Elizabeth Tappin

Talk about Teaching
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Acknowledgments

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Agenda

• 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


- 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)

**Overall Strategy Use**

<table>
<thead>
<tr>
<th>Percentage of Students</th>
<th>Reading</th>
<th>Help Seeking</th>
<th>Retrieval Practice</th>
<th>Note Taking</th>
</tr>
</thead>
<tbody>
<tr>
<td>Percentage</td>
<td>53%</td>
<td>44%</td>
<td>40%</td>
<td>13%</td>
</tr>
</tbody>
</table>

Other Types < 5%
<table>
<thead>
<tr>
<th>Deep</th>
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<tbody>
<tr>
<td>I space out my study sessions in the time leading up to the exam</td>
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<tr>
<td>I relate what I am reading for the course to classroom sessions</td>
</tr>
<tr>
<td>I test myself on course materials without referring to my course materials or notes, etc.</td>
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<tr>
<td>I plan effectively for study time between classes</td>
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<tr>
<td>I summarize in my own words information I learn from my study</td>
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<tr>
<td>I explain concepts to a classmate/friend</td>
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<tr>
<td>I create outlines, charts, diagrams, or tables, etc., to organize and help me see patterns in course information</td>
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<tr>
<td>Shallow</td>
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<td>-------------------------</td>
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CHOOSING A COGNITIVELY-BASED STUDY STRATEGY
How do we “activate” and enhance student learning?

It depends . . .
It Depends?

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)
STUDENT COGNITION TOOLBOX STUDY STRATEGIES
SCT

Elaborative Interrogation

Worked Examples

Distributive Practice (Spacing)

Self-explanation

Test Enhanced Learning

Interleaved Practice
## Fall 2019 and Spring 2020

~2000 UNH students from a variety of courses

<table>
<thead>
<tr>
<th>Biology</th>
<th>Political Science</th>
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<tbody>
<tr>
<td>Chemistry</td>
<td>First-year Writing</td>
</tr>
<tr>
<td>Psychology</td>
<td>Mythology</td>
</tr>
<tr>
<td>Statistics</td>
<td>Animal Health</td>
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<tr>
<td>Cybersecurity</td>
<td>US Health Care Systems</td>
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<tr>
<td>Nursing</td>
<td>Weather</td>
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<tr>
<td>Body Fluids</td>
<td>Phlebotomy</td>
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<tr>
<td>PLTL Leaders</td>
<td>Earth Sciences</td>
</tr>
</tbody>
</table>
Fall 2019 and Spring 2020

• 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
THE SBI: PRE AND POST DEEP PROCESSING
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...

Student Ratings

Error Bars 95% CI
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...

Student Ratings
Study behavior Inventory Deep Processing Responses Pre and Post SCT

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

- Learning Outcome
- SCT Modules
- Learning Activities
- Final Assessment
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