

Motivational Assessments of the Effectiveness of LC-DLMs

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Learning Objectives

- **At the end of this presentation, attendees will be able to**
 - ▣ Describe research designs
 - ▣ Describe different forms of assessment
 - ▣ Describe the need for motivational assessment
 - ▣ Describe motivational assessments in LC-DLM experiments

RESEARCH DESIGNS

Research Designs

- Researchers are designers, much like architects, creating different types of designs in their blueprints
- **Experimental Research Designs**
- Intervention or treatment known as a manipulation
 - *True experimental*
 - ***Quasi-experimental***
 - *Single-subject*

Quasi Experimental Designs

Examples of Quasi Experimental Research Design

- **Quasi-experimental design**
- **Matched Comparison Group**
- Time Series design

Quasi-Experimental Design for LC-DLMs

- Represented as:

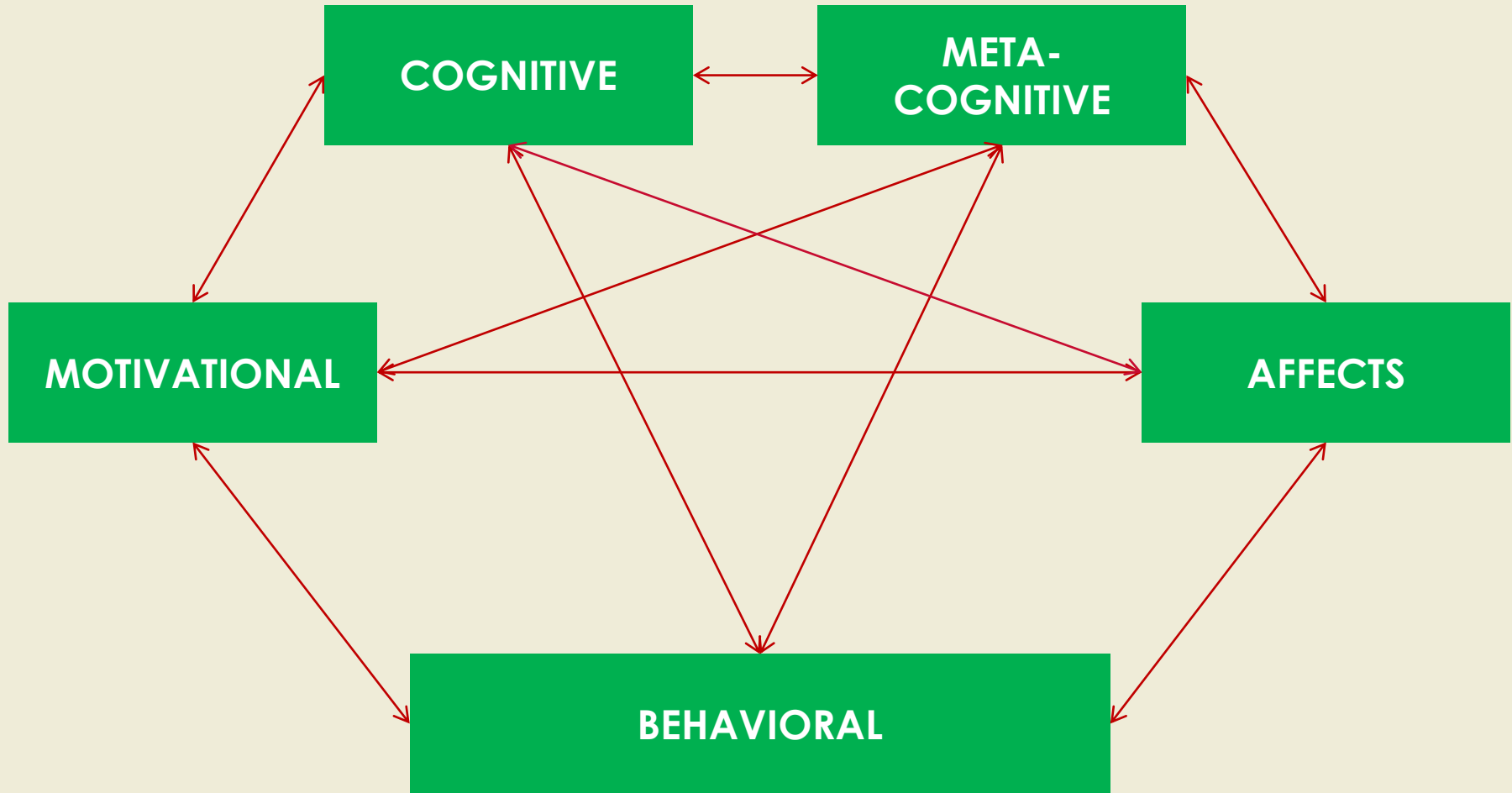
- **Pre T Post**

- where P = pretest; T = treatment or experimental (LC-DLM) intervention; Post = posttest

- Could be a desirable research design for LC-DLM because of ethical issues
- A whole class is first given a pretest, then given the LC-DLMs to work with and finally offered a posttest
- Students scores on the pretest is then compared with their posttest scores.
- In addition, posttest scores could be compared with posttest scores of other topics taught with lectures within the same semester – with the same students.

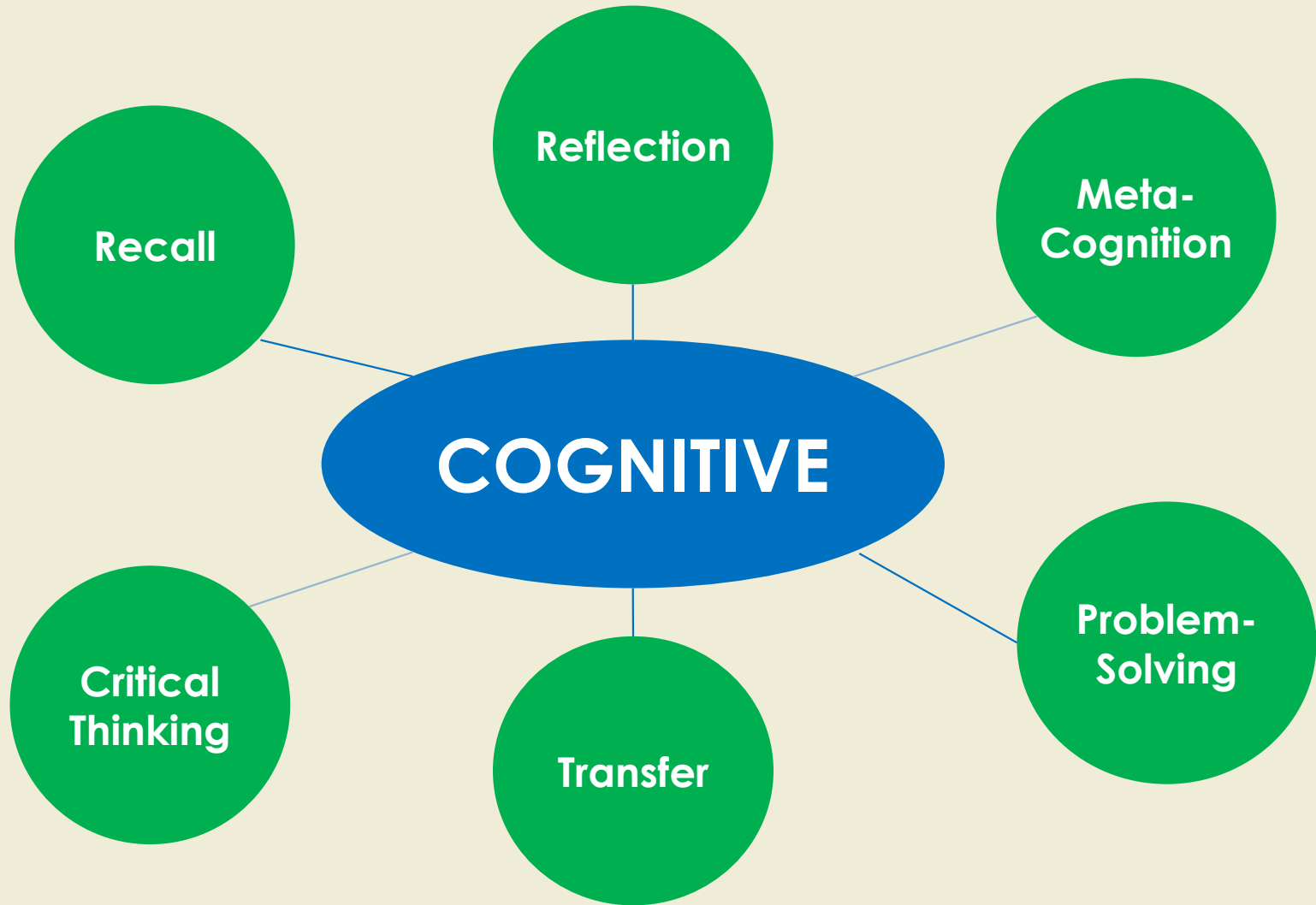
**NEED FOR
MOTIVATIONAL
ASSESSMENT**

Data Collection



- Indicators of successful intervention go beyond only cognitive measures
- Researchers can obtain data about many other factors as control or dependent measures
- These factors are also interrelated, and their relationships can be multi-directional

Cognitive Assessment



- What do you think is missing from these measures of cognitive assessment?

Example of Motivational Measures



Motivational Assessments In LC-DLMS

Motivational Assessments in LC-DLMs

- Cognitive measures (e.g., multiple choice, true/false, short answer, etc.) used in the project
- We use different motivational measures to complement cognitive measures.
- Motivational measures include **adapted versions of the MSLQ and a new instrument developed to measure engagement**

Assessments done online – in Qualtrics

Motivational Assessments in LC-DLMs

- MSLQ measures include motivational subscales such as intrinsic goal orientation, extrinsic goal orientation, task value, self-efficacy, etc.
- Engagement measures include the degree to which LC-DLM activities fostered interactive, constructive, active and passive forms of engagement

Adapted MSLQ Questions for DLM Group

- Compared to lectures alone, if all topics in this course were taught using LC-DLMs:
 - I'm certain I could understand the most difficult material presented in the readings for this course.
 - I'm confident I could learn the basic concepts taught in this course.
 - I'm confident I could understand the most complex material presented by the instructor in this course.
 - I might be able to see how what I learn in this course can be used in other courses.
 - I might be more interested in the content area of this course.

Self
Efficacy

Task
Value

Adapted ICAP Questions for DLM Group

- ❑ Compared with other topics in this course that were offered through only lectures:
 - ❑ The use of LC-DLMs helped me discuss with a peer about venturi concepts more than I could with a lecture
 - ❑ The use of LC-DLMs encouraged me to clarify my understanding of venturi with my peers
 - ❑ The use of LC-DLMs encouraged me to explain the material to a classmate or friend
 - ❑ The use of LC-DLMs helped me take good notes about venturi concepts better than lectures
 - ❑ The use of LC-DLMs helped me self-explain the concepts to myself better than lectures

Interactive

Constructive

Research Design For LC-DLMs

**Within-subjects & Between-
subjects designs**

Suggested Research Design

- We suggest using this research design

□ Year	Experimental	Control	Course
□ 1	Hydraulic Loss or Double Pipe	Venturi Meter or Shell & Tube	FM HT
□ 2	Venturi Meter or Shell & Tube	Hydraulic Loss or Double Pipe	FM HT
□ 3	Hydraulic Loss & VM Double Pipe and S & T	Year 1 Control Data	
□ 4	Hydraulic Loss & VM Double Pipe and S & T	Year 2 Control Data	

- *FM = Fluid Mechanics; HT = Heat Transfer; VM = Venturi Meter; S & T = Shell & Tube

Thank You!