

INSTRUCTIONS AND OBJECTIVES

MASTERS COMPREHENSIVE EXAM IN LEARNING SCIENCES

The masters comprehensive exam in Learning Sciences is drawn from three subject areas: 1) cognition, 2) motivation and self-regulated learning, and 3) teaching and learning strategies. These three subject areas are covered in two of the program's core courses: EDPS 854, Cognition and Instruction, and EDPS 855, Teaching Learners to Learn. The material is also covered in the course textbooks: *Cognitive Psychology and Instruction*, 5th edition, by Bruning, Schraw, and Norby (EDPS 854) and *Teaching How to Learn* by Kiewra (EDPS 855).

The actual exam will include three essay-type questions with one question drawn from each of the three subject areas listed above. You will choose two of the three questions to answer.

To help you prepare for the exam, an objective has been generated for each subject area.

Cognition Objective

Given a group of learners (e.g., 9th grade geometry students), a description of a learning context (e.g., a lesson on angle types), and a learning goal (e.g., defining and recognizing angle types), use either provided key cognitive concepts (see list below) or provided key cognitive principles (see list below) to provide a psychologically-based account for maximizing learning in the given situation.

Key cognitive concepts

Attention; perception; sensory, working, and long-term memory; semantic and episodic memory; imagery; implicit memory; encoding and retrieval; encoding specificity; levels of processing; constructivist learning; concepts; principles; declarative and procedural knowledge; propositions; spreading activation; intrinsic, extraneous, and germane cognitive load; schemata; modeling and vicarious learning.

Key cognitive principles (themes from Chapter 1 of *Cognitive Psychology and Instruction*, 5th edition):

1. Learning is a constructive, not a receptive, process
2. Mental frameworks organize memory and guide thought
3. Extended practice is needed to develop cognitive skills
4. Development of self-awareness and self-regulation is critical to cognitive growth
5. Motivation and beliefs are integral to cognition
6. Social interaction is fundamental to cognitive development
7. Knowledge, strategies, and expertise are contextual
8. A cognitive approach to teaching implies new approaches to assessment

Motivation and Self-Regulation Objective

In preparation for the comprehensive exam, students should know the definitions, components/factors, predictors, and affective and behavioral correlates of the motivational constructs and theories listed below. Students should be prepared to describe how one or more of these constructs can be applied to classroom/professional settings. Students should be prepared to describe typical student/client characteristics of a single motivational construct (e.g., a student/client with high self-efficacy) and student/client characteristics of multiple motivational characteristics (e.g., a student/client with low-self-efficacy and performance avoidance goals). Finally, students should be prepared to describe how a teacher might impact students' motivation and beliefs. Key ideas to be familiar with, and found in *Cognitive Psychology and Instruction*, 5th edition, include:

- Self-efficacy
- Self-determination theory
- Outcome expectancies
- Personal achievement goals/goal orientation
- Classroom goal structures
- Implicit beliefs
- Attributions
- Self-regulated learning

Teaching and Learning Strategies Objective

Given a small set of material to be learned (e.g., terms and definitions, a passage, a list, a matrix...), the student will a) explain and demonstrate how a teacher would use one or more of the SOAR method components (i.e., selection, organization, association, and regulation) to help students learn this material and b) demonstrate how to embed strategy instruction (clearly using and labeling all four strategy instruction components) using this material. Address this objective by consulting the text *Teaching How to Learn*.