

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 courses: EDPS 854, Cognition and Instruction, and EDPS 855, Teaching Learners to Learn. The material is also covered in the respective course textbooks: *Cognitive Psychology and Instruction*, 5th edition, by Bruning, Schraw, and Norby (EDPS 854); and *Teaching How to Learn* by Kiewra (EDPS 855). A copy of each textbook is available for check out in the Department office (TC 114).

The actual exam includes three essay-type questions with one question drawn from each of the three subject areas listed above. Students taking the test choose and answer two of the three questions.

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

1) 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 provided key cognitive concepts and/or provided key cognitive principles found in *Cognitive Psychology and Instruction*, 5th edition (and listed below) to provide a psychologically-based account for maximizing teaching and 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; and providing student feedback.

Key cognitive principles

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

9. Students often come to school with naïve beliefs and require conceptual change

2) 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
- Feedback
- Outcome expectancies
- Implicit beliefs
- Entity and incremental theories
- Attributions
- Self-regulated learning
- Mastery and performance orientations

3) 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*.