Psychology 506: Learning and Cognition

Summer 2014
Location: Seeley G. Mudd Building, Room 601
Days and Time: Monday, Tuesday, Wednesday; 2:30 p.m. to 5:20 p.m.
Online portion at http://blackboard.usc.edu

Instructor Information
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Syllabus

Course Description

You are in a Ph.D. program and, obviously, know how to learn information. However, do you know how you learn information? If you were asked how to teach a course with the best learning environment, would you know how to set up such a course? This course is about applying principles of learning that have been scientifically tested. Modern principles of learning come from the field "Applying the Science of Learning" with the goal to help people become lifelong learners. This class will cover the fundamental and theoretical concepts along with empirical evidence for cognitive load theory, metacognition, attention, working memory, long-term memory, knowledge representation, thinking and reasoning, decision making, and intelligence. For each core concept we will talk about principles of learning that impact the construct to maximize a person's learning of new information. In the process of connecting principles of learning to core cognitive constructs, you will apply the information to create a course that will provide people with the best possible learning experience and environment.

Teaching Objectives

- Provide students with the appropriate theoretical background of cognitive psychology specifically for complex learning and thinking processes.
- Facilitate students' analysis and synthesis of how cognitive processes are studied using valid scientific methods.
- Provide information about how to apply principles of learning in constructing a college course.

Student Learning Objectives

After successfully completing this course, students will be able to . . .

- discuss and debate the core concepts in cognitive psychology.
- apply principles of learning and memory to help in academic, job-related, and everyday performances.
- critically analyze peer-reviewed journal articles in cognitive psychology.
- develop a course syllabus.
- verbally present and defend a controversial position in cognitive psychology.

Text

Articles and book chapters will be posted on Blackboard.

Assessment	Due Date	% of final grade
Participation	Continuous	15 (individual grade)
Discussion Leader	Varies per individual	15 (individual grade)
Debate Performance	June 16th	15 (individual grade)
Syllabus Dossier for Chosen Course	June 25th at Beginning of Class	25 (individual grade)
Defense of Syllabus	July 1st	15 (individual grade)
Evaluation of Syllabus Dossier	July 1st at Beginning of Class	15 (individual grade)

Participation Points

Participation is defined as attending classes regularly, providing your input about the daily topic, and asking questions. There will be two to three required articles for everyone to read for each class session. You are also required to find a peer reviewed article that investigates a principle of learning that impacts the cognitive construct we are covering for that class period. Providing input on the topic and the original article you found will be graded base on the quality of critical thought, analysis, and synthesis of the material. Simply summarizing and regurgitating what you read will lead to a lower grade. In-class written exercises may occasionally be assigned in class in order to help you engage with material and discuss during class.

Discussion Leader for Assigned Readings

Each person will provide a mini-lecture lead the discussion for two class sessions. You will choose two topics you would like to lead discussion. We will schedule the discussion leaders on the first day of class. Students who are not leading discussion are required to participate in the discussion by sharing their thoughts on the articles and chapters they read for each session. I am available to meet with the discussion leader any time to provide suggestions or guidance.

Debate Performance

There are a number of controversial topics in learning and cognition, but none more heated that sex differences in cognitive abilities and the implications for how boys and girls learn. Thus, you will defend a position in a debate on the following topic: Should boys and girls be put in separate, single-sex classrooms throughout grade school? We will follow the Modified Karl Popper Debate Format. Rules and guidelines will be provided in a separate document.

Dossier for Chosen Course

You will create a dossier for a course that you would like to teach. The primary document of the dossier is the syllabus. Your syllabus and dossier materials should be created based on the principles of learning and cognitive constructs we cover in the class to maximize the learning that would occur in the course. A more detailed account of this assignment will be provided in a separate document.

Presentation and Defense of Dossier

You will present and defend your dossier on the last day of class. You will provide a 10-12 presentation and explanation of your dossier. After the presentation you will be asked questions by two other students who will have had time to review your dossier. After the reviewers' questions, you will answer questions from the remainder of the class.

Evaluation of Syllabus Dossier

Each person will review two dossiers. Based on your analysis, you will develop questions to ask the person after presenting the dossier. Your questions should be critical of the principles of

learning and care taken in fostering a positive and strong learning environment. You will be given specific instructions and guidelines on how to review a dossier in a separate document.

Grading Scheme

A = 100 - 93.5%; A- = 93.4 - 89.5%; B+ = 89.4 - 86.5%; B = 86.4 - 83.5%; B- = 83.4 - 79.5%; C+ = 79.4 - 76.5%; C = 76.4 - 73.5%; C- = 73.4 - 69.5%; D+ = 69.4 - 66.5%; D = 66.4 - 63.5%; D- = 63.4 - 59.5%; Below 59.5% = F

Course and University Policies

1) Missed Days: Please try not to miss any days as we are on a very tight and quick schedule for this course. I understand there are conferences and weddings during this time of year, so if you need to miss a day, please let me know ahead of time so that we can work out a way to make up your participation for that day.
2) Feedback: The instructor will make every attempt to return assignments or provide feedback in a reasonable time by returning them no later than two weeks after the due date.
3) Tardy Policy: Do NOT show up late. Period.
4) Cell Phone and Electronic Device Policy: Cell phones should be turned off during class and lab. Do NOT leave cell phones on vibrate and do **NOT** text message during class. Computers may NOT be open during lectures.
5) Course Participation: You are expected to be prepared for class by completing the required readings or exercises BEFORE class, and should be prepared for discussion of the assignments.
6) Academic Dishonesty: Plagiarism, lazy writing, and cheating are violations of the Student Judicial Affairs & Community Standards and may be dealt with by both the instructor and the university. Plagiarism is defined as, "the act of presenting the ideas and writings of another as one's own." Lazy writing is defined as, "using quotes or paragraphs with the proper citation, but are used in a manner that a paper is stitched together and clearly has little or no original writing." Cheating is defined as, "the act of obtaining or attempting to obtain credit for academic work through the use of any dishonest, deceptive, or fraudulent means." In instances of academic dishonesty, the instructor will take appropriate action as outlined in the Academic Integrity Review Process (SJACS 14.10).
7) Support for Student with Disabilities: If you are in need of an accommodation for a disability in order to participate in this class, please see the instructor and contact Disabilities Services and Program at (213) 740-0776.
8) University Escort Service: If you feel that you would like to be escorted to your vehicle, bus, or campus residence after 5:00 p.m., do not hesitate to call (213) 740-4911.

Instructor-Student Communication and Blackboard

Blackboard (Bb) will be used to post announcements, send e-mails, and post all grades and course materials, so it is the student's responsibility to frequently visit the course on Blackboard (website: http://blackboard.usc.edu). Any assignments you complete will be turned in on Bb. Please see Bb for a document titled "Guidelines for Bb Assignments" to help you avoid problems turning in assignments. Bb transactions will follow the below guidelines.

1) Grades: All grades and points will be posted on Bb one to two weeks after the

completion of the exam, assignment, or activity. Grades will not be announced in class, via e-mail, or during office hours.

2) Course materials: The syllabus, homework assignments, and reading material can be viewed and printed from Bb.
3) Announcements: Class announcements will be posted on Bb, as well as broadcasted in class.
4) Email: Any e-mail communications from the instructor will be sent via Bb or through the USC's email service. USC requires that all e-mail communication between the instructor and students be sent via an official USC e-mail address. *Any student communication delivered from a non-USC e-mail address will be automatically discarded*. Lastly, please keep your emails professional by including a salutation, using complete sentences in the body of the text, and a complimentary closing that includes your name and the course name in which you are enrolled.

Special Notes

1) The events for each day will approximate the following schedule: a) 50-60 minutes, students will lead discussion; b) 20 minute break; c) 30-40 minutes, work on dossier or debate; d) 45-60 minutes, Clayton will prime/prepare students for next session.
2) More than anything else, I want us to have fun, intelligent, meaningful discussions about each topic that will help you advance in your own field of expertise!
3) All assignments should be completed using APA-style, including the use of a title page that adheres to the APA publication manual. Furthermore, all assignments in this course are expected to be word-processed and graphs/tables should be computer-generated unless otherwise specified.
4) All students are expected to have access to the student computer network. It is your responsibility to ensure that your access is up-to-date during the semester.
5) The Writing Center is also available to tutor students who are having difficulty with writing. For assistance, visit their website at http://college.usc.edu/writingcenter/ or call (213) 740-3691.

Tentative Schedule of Topics and Assignments

Week & Topic	Date and Readings		
Week 1	5/21/2014		
Information Processing	➢ Introductions ➢ Overview of course ➢ Philosophical Issues		
Week 2	5/26/2014	5/27/2014	5/28/2014
Foundations	➢ NO CLASS! ➢ MEMORIAL DAY!	➢ Constructivism ➢ Information Processing ➢ Pretraining ➢ Personalization	➢ Cognitive Load Theory ➢ Clarifying Objectives ➢ Anchored Learning
Week 3	6/02/2014	6/03/2014	6/04/2014
Attention Metacognition	➢ Attention ➢ Transfer ➢ Contextual Learning	➢ Metacognition ➢ Reciprocal Teaching	➢ Self-Regulation ➢ Desirable Difficulties

Week & Topic	Date and Readings		
Week 4	6/09/2014	6/10/2014	6/11/2014
Memory	➢ Working Memory ➢ Segmenting ➢ Modality ➢ Coherence ➢ Spatial Contiguity	➢ Short-Term Memory ➢ Negative Suggestion Effects ➢ Stories & Example Cases	➢ Long-Term Memory ➢ Distributed Learning ➢ Testing Effects
Week 5	6/16/2014	6/17/2014	6/18/2014
Constructing & Storing Knowledge	➢ Debates! ➢ Sex Differences	➢ Semantic Memory ➢ Explanation Effects ➢ Discovery Learning	➢ Knowledge Representation ➢ Asking Deep Questions ➢ Anchored Learning
Week 6	6/23/2014	6/24/2014	6/25/2014
Using Feedback and Creating Knowledge	➢ Levels of Processing ➢ Generation Effect ➢ Multiple Examples ➢ Goldilocks Principle	➢ Thinking & Reasoning ➢ Desirable Difficulties ➢ Cognitive Disequilibrium	➢ Judgment and Decision Making ➢ Feedback ➢ Cognitive Flexibility
Week 7	6/30/2014		7/01/2014
Intelligence Creativity	➢ Intelligence ➢ Creativity ➢ Cognitive Training		➢ Present Syllabus Dossier and Defend use of Principles of Learning

Syllabus as a Contract

The purpose of this syllabus is to provide a contract between the professor and the student. By enrolling in this class, the student agrees that he/she has read, understands, and will adhere to the syllabus guidelines and complete the assignments given in the class. The professor reserves the right to change the schedule of topics and readings and will give notice to the students of such changes well in advance of those changes.

List of Prominent Journals in Cognitive Psychology

Aging, Neuropsychology, & Cognition
Applied Cognitive Psychology
Bilingualism: Language and Cognition
Brain and Cognition
Brain and Mind
Cerebral Cortex
Cognition
Cognition and Emotion
Cognition and Instruction
Cognitive Brain Research
Cognitive Development
Cognitive Linguistics
Cognitive Neuropsychology
Cognitive Psychology
Cognitive Science: A Multidisciplinary Journal
Consciousness and Cognition
Creativity Research Journal
European Journal of Cognitive Psychology
Human Brain Mapping
Intelligence
Journal of Applied Research in Intellectual Disabilities
Journal of Artificial Intelligence Research
Journal of Behavioral Decision Making
Journal of Cognition and Development
Journal of Cognitive Neuroscience
Journal of Creative Behavior
Journal of Experimental Psychology: General
Journal of Experimental Psychology: Learning, Memory, and Cognition
Journal of Mind and Behavior
Language & Cognitive Processes
Language Learning and Development
Learning & Individual Differences
Learning & Memory
Memory
Memory & Cognition
Psychological Science
Social Cognition
Thinking & Reasoning
Trends in Cognitive Sciences
Visual Cognition

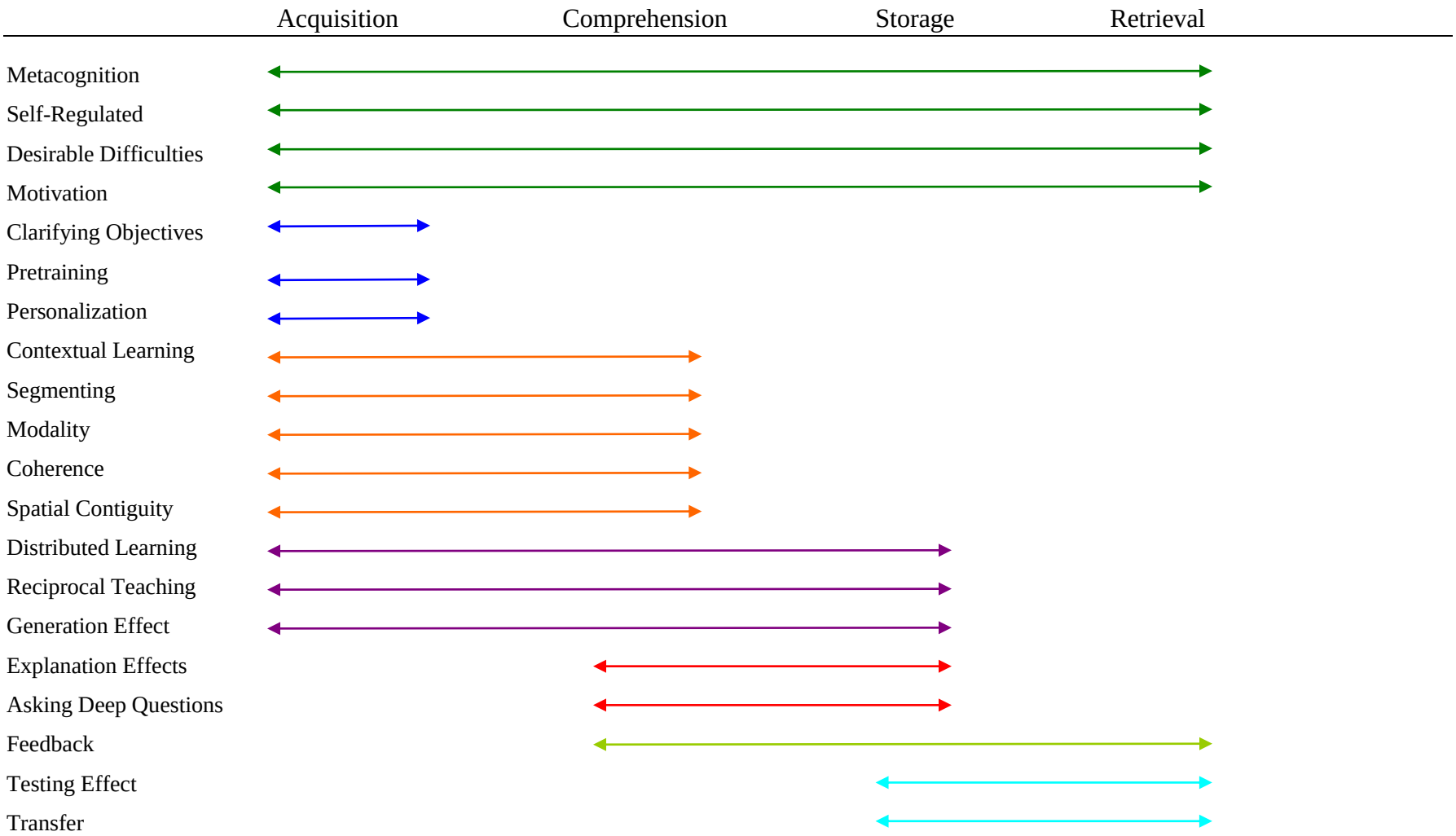
Twenty-five Principles of Learning

1. Contiguity Effects. Ideas that need to be associated should be presented contiguously in space and time.
2. Perceptual-Motor Grounding. Concepts benefit from being grounded in perceptual motor experiences, particularly at early stages of learning.
3. Dual Code and Multimedia Effects. Materials presented in verbal, visual, and multimedia form richer representations than a single medium.
4. Testing Effect. Testing enhances learning, particularly when the tests are aligned with important content.
5. Spacing Effect. Spaced schedules of studying and testing produce better long-term retention than a single study session or test.
6. Exam Expectations. Students benefit more from repeated testing when they expect a final exam.
7. Generation Effect. Learning is enhanced when learners produce answers compared to having them recognize answers.
8. Organization Effects. Outlining, integrating, and synthesizing information produces better learning than rereading materials or other more passive strategies.
9. Coherence Effect. Materials and multimedia should explicitly link related ideas and minimize distracting irrelevant material.
10. Stories and Example Cases. Stories and example cases tend to be remembered better than didactic facts and abstract principles.
11. Multiple Examples. An understanding of an abstract concept improves with multiple and varied examples.
12. Feedback Effects. Students benefit from feedback on their performance in a learning task, but the timing of the feedback depends on the task.
13. Negative Suggestion Effects. Learning wrong information can be reduced when feedback is immediate.
14. Desirable Difficulties. Challenges make learning and retrieval effortful and thereby have positive effects on long-term retention.
15. Manageable Cognitive Load. The information presented to the learner should not overload working memory.
16. Segmentation Principle. A complex lesson should be broken down into manageable subparts.
17. Explanation Effects. Students benefit more from constructing deep coherent explanations (mental models) of the material than memorizing shallow isolated facts.
18. Deep Questions. Students benefit more from asking and answering deep questions that elicit explanations (e.g., why, why not, how, what-if) than shallow questions (e.g., who, what, when, where).
19. Cognitive Disequilibrium. Deep reasoning and learning is stimulated by problems that create cognitive disequilibrium, such as obstacles to goals, contradictions, conflict, and anomalies.
20. Cognitive Flexibility. Cognitive flexibility improves with multiple viewpoints that link facts, skills, procedures, and deep conceptual principles.
21. Goldilocks Principle. Assignments should not be too hard or too easy, but at the right level of difficulty for the student's level of skill or prior knowledge.
22. Imperfect Metacognition. Students rarely have an accurate knowledge of their cognition, so their ability to calibrate their comprehension, learning, and memory should not be trusted.
23. Discovery Learning. Most students have trouble discovering important principles on their own, without careful guidance, scaffolding, or materials with well-crafted affordances.
24. Self-Regulated Learning. Most students need training on how to self-regulate their learning and other cognitive processes.
25. Anchored Learning. Learning is deeper and students are more motivated when the materials and skills are anchored in real-world problems that matter to the learner.

Note. Adapted from *25 Principles of Learning*, by A. C. Graesser, D. F. Halpern, and M. Hakel, 2008, Task Force on Lifelong Learning at Work and at Home, http://www.psyc.memphis.edu/learning/whatweknow/index.shtml

Figure 1. Table of Principles of Learning from Graesser (2009).

Stratification of Principles According to Information Processing Stages[1]



1 While all of the principles could be perceived as influencing all stages of the information processing model, the principles were put into the categories that they best fit, and provide the most detail and explanation.