Advanced Principles of Learning and Cognition (PSCL 587)

Spring, 2011

Instructor

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Office Hours: M: 9:30 - 9:50, 11:00 – 11:20; W: 9:30 - 9:50, 11:00 - 11:50 in LS 24C
and by appointment.

Course Objectives

My goal is to provide students with a broad overview of major topics in cognition and learning through the discussion of assigned readings. The course will be conducted as a seminar, with students assisting with presentations and discussion. In addition, each student will select an article to report on at the end of the course.

I like this quote and hope we can apply it:

Reading furnishes the mind only with materials of knowledge; it is thinking that makes what we read ours.

—*John Locke (English philosopher)*

Class Presentations

We will take turns volunteering to present the assigned readings. You should prepare a detailed outline of the article to give others in the course. However, remember that a seminar benefits from discussion so you should encourage discussion by pausing for questions, raising your own questions, adding critiques, and initiating discussion by asking (three) questions for the class to answer. I will also occasionally interrupt to ask questions or provide additional material.

You should check with me regarding the article that you want to present at the end of the course. Your presentation should include a brief outline with a reference.

Grades

There are two exams; each consisting of four essay questions that are based on material covered in class. The two exam scores will determine the grade for the course. This grade may be slightly modified by attendance and participation.

Reading List

Introduction [January 26]

Gentner, D. (2010). Psychology in cognitive science: 1978-2038. *Topics in Cognitive Science*, 2, 328-344.

Sawyer, R. K. (2006). Introduction: The new science of learning. In R. K. Sawyer (Ed.) *The Cambridge Handbook of the Learning Sciences* (pp. 1-16). New York: Cambridge University Press.

Embodied Cognition [February 2]

Barsalou, L. (2003). Grounding conceptual knowledge in modality-specific systems. *TRENDS in Cognitive Sciences*, 7, 84-91.

Wilson, M. (2002). Six views of embodied cognition. *Psychonomic Bulletin & Review*, 9, 625-636. [Skip claim 4, pp. 629-631].

Imagery [February 9]

Tversky, B. (2005). Visuospatial reasoning. In K. J. Holyoak & R. G. Morrison (Eds.), *The Cambridge handbook of thinking and reasoning* (pp. 209-240). New York: Cambridge University Press. [Skip mental spatial inferences, pp. 217-221].

Schwartz, D. L., & Heiser, J. (2004). Spatial representations and imagery in learning. In R. K. Sawyer (Ed.), *The Cambridge Handbook of the Learning Sciences* (pp. 283-298). New York: Cambridge University Press.

Action [February 16]

Glenberg, A. M. (2009). Embodiment for education. In P. Calvo and A. Gomila (Eds), *Handbook of cognitive science: An embodied approach* (pp. 355-372). New York: Cambridge University Press.

Goldin-Meadow, S., & Beilock, S. L. (2010). Action's influence on thought: The case of gesture. *Perspectives on Psychological Science*, 5, 664-674.

Integration of Codes [February 23]

Baddeley, A. (2000). The episodic buffer: a new component of working memory? *TRENDS in Cognitive Sciences*, 4, 417-423.

Reed, S. K. (2006). Cognitive architectures for multimedia learning. *Educational Psychologist*, 41, 87-98.

EXAM 1 [March 2]

Cognitive Load Theory [March 9]

Moreno, R. & Park, B. (2010). Cognitive load theory: Historical development and relation to other theories. In J. L. Plass, R. Moreno, & R. Brunken (Eds), *Cognitive load theory* (pp. 9-26). New York: Cambridge University Press.

Kirschner, P. A., Sweller, J., & Clark, R. F. (2006). Why minimal guidance during instruction does not work: An analysis of the failure of constructivist, discovery, problem-based, experiential, and inquiry-based teaching. *Educational Psychologist*, 41, 75-86.

Constructivist Learning [March 16]

Chi, M. T. H. (2009). Active-constructive-interactive: A conceptual framework for differentiating learning activities. *Topics in Cognitive Science*, 1, 2009, 73-105.

Hmelo-Silver, C. E., Duncan, R. V., and Chinn, C. A. (2007). Scaffolding and achievement in problem-based and inquiry learning: A response to Kirschner, Sweller, and Clark (2006). *Educational Psychologist*, 42, 99-107.

Intelligence and Reasoning [March 23]

Sternberg, R. J. (1998). Abilities are forms of developing expertise. *Educational Researcher*, 27, 11-20.

Sloman, S. A. (2002). Two systems of reasoning. In T. Gilovich, D. Griffin, & D. Kahneman (Eds.), *Heuristics and biases: the psychology of intuitive judgment* (pp. 379-396). Cambridge: Cambridge University Press.

Intelligence and Rational thinking [April 6]

Stanovich, K. E., & Stanovich, P. J. (2010). A framework for critical thinking, rational thinking, and intelligence. In D. Preiss & R. J. Sternberg (Eds.), *Innovations in educational psychology: Perspectives on learning, teaching and human development* (pp. 195-237). New York: Springer.

Cognitive vs. Sociocultural Learning [April 13]

Vosniadou, S. (2007). The cognitive-situative divide and the problem of conceptual change. *Educational Psychologist*, 42, 55-66.

Alexander, P. A. (2007). Bridging cognition and socioculturalism within conceptual change research: Unnecessary foray or unachievable feat? *Educational Psychologist*, 42, 67-73.

EXAM 2 [April 20]

Student Articles: April 27, May 4, May 11.