

Fall 2016
Cognition & Instruction
16:300:582:01
3 Credits
Thursdays, 3:00pm – 5:40 pm, ED–Room 314

Instructor Name: Janice Gobert	Email address: janice.gobert@gse.rutgers.edu
Phone Number: 848-932-0867	10 Seminary Place, Room 350
Office Hours: By appointment	Prerequisites or other limitations: none
Mode of Instruction: <input type="checkbox"/> Lecture <input checked="" type="checkbox"/> Seminar <input type="checkbox"/> Hybrid <input type="checkbox"/> Online <input type="checkbox"/> Other	Permission required: <input checked="" type="checkbox"/> No <input type="checkbox"/> Yes Directions about where to get permission numbers:

Learning goals:

1. To become familiar with important issues and research about human cognition and their implications for instruction
2. To understand important historical methodological approaches to the study of human cognition
3. To read original research and syntheses of research carefully and critically and to be able to understand deeply the arguments of the readings.
4. To be able to make connections between related concepts in human cognition.

Course catalog description:

This course reviews selected topics in the study of human cognition and their implications for instruction. We review critical ideas that consider how people learn and also explore historical trends in the evolution of theories about human cognition. We will review studies that examine particular instructional approaches suggested by theory and research on human cognition.

Class materials/Textbooks:

Selections from:

Sawyer, K. (2014). *The Cambridge handbook of the learning sciences* (2nd ed). New York: Cambridge University Press.

Grading:

- 50% - take home (25%)/in class exam (25%)
- 15% - Presentation
- 15% - Presentation write up
- 10% - Weekly discussion questions

10% - Class discussion/participation

Course web site:

There is a web site for the course implemented in the course system. The web site will be used to post the course syllabus, assignments, lecture notes, and other course documents, to make announcements, to post grades, and to create a discussion board where students can look post their comments & questions, and discuss various aspects of the course.

Notes on the readings:

Students are to come to class having READ the required material and having posted at least 3 comments/questions on the course site. Each reading will have a discussion board "area". Power point notes will be made available on the site.

Weekly questions:

Before every class (Wednesday 3pm), you will be expected to submit at least 3 questions that came up during the readings. These questions will help guide the discussions in class to address themes across the papers. Students should try to synthesize and integrate knowledge in order to demonstrate that you are knowledge producers and not merely knowledge consumers. Comments posted will be evaluated with that (knowledge production versus knowledge consumption) as a guiding parameter.

Presentation & write up:

Students will choose a series of journal articles (5) on one of the branching themes of the course and review their findings, over-arching theme, etc. Will also lead a discussion on this in the class.

Exam:

The exam will have a take home portion, as well as an in class portion. The later will cover all material from the class readings *and* discussions. Questions will be short answer format. The take home will include the review/critique some articles in LS (2-3; TBD)

Academic Integrity Policy:

The Office of Student Conduct supervises issues related to violations of academic integrity

(see <http://academicintegrity.rutgers.edu>). Please familiarize yourself with the university policy on academic integrity at http://academicintegrity.rutgers.edu/files/documents/AI_Policy_2013.pdf

Office of Disability Services:

Rutgers University welcomes students with disabilities into all of the University's educational programs. In order to receive consideration for reasonable accommodations, a student with a disability must contact the appropriate disability services office at the campus where you are officially enrolled, participate in an intake interview, and provide documentation: <https://ods.rutgers.edu/students/documentation-guidelines>. If the documentation supports your request for reasonable accommodations, your campus's disability services office will provide you with a Letter of Accommodations. Please share this letter with your instructors and discuss the

accommodations with them as early in your courses as possible. To begin this process, please complete the Registration form on the ODS web site at:
<https://ods.rutgers.edu/students/registration-form>.

Course Schedule:

Week	Assignments & Readings
Week 1 (September 8, 2016)	Introduction to Course
Week 2 (September 15, 2016)	Perspectives and Frameworks Sternberg, R., & Williams, W. (2009) The development of cognitive, learning, and language skills. In <i>Educational Psychology</i> (2nd ed.) (pp. 35-71). New York, NY: Pearson. Strauss, S. (1993). Teachers' pedagogical content knowledge about children's minds and learning: Implications for teacher education. <i>Educational Psychologist</i> , 28(3), 279-290. Strauss, S. (1993). Theories of learning and development for academics and educators. <i>Educational Psychologist</i> , 28(3), 191-203. Strauss, S. (2000). Theories of cognitive development and learning and their implications for curriculum development and teaching. <i>Routledge international companion to education</i> , 28-50.
Week 3 (September 22, 2016)	Perspectives Continued Sternberg, R., & Williams, W. (2009) The development of cognitive, learning, and language skills. In <i>Educational Psychology</i> (2nd ed.) (pp. 35-71). New York, NY: Pearson.
Week 4 (September 29, 2016)	Information Processing Craik, F. & Lockhart, R. (1972). Levels of Processing: A Framework for memory research. <i>JVLVB</i> , 11, 671-684. Miller, G. A. (1956). The magical number seven, plus or minus two: Some limits on our capacity for processing information. <i>Psychological Review</i> , 63, 81-97. Retrieved from http://psychclassics.yorku.ca/Miller/
Week 5 (October 6, 2016)	Working Memory Chi, M. T. H., Feltovich, P. J., & Glaser, R. (1981). Categorization and representation of physics problems by experts and novices. <i>Cognitive Science</i> , 5(1), 121-152. doi: 10.1207/s15516709cog0502_2 Cowan, N. (2014). Working memory underpins cognitive development, learning, and education. <i>Educational Psychology Review</i> , 26(2), 197-223.
Week 6 (October 13, 2016)	Cognitive Load Sweller, J. (2015). Working memory, long-term memory, and instructional design. <i>Journal of Applied Research in Memory and Cognition</i> . De Jong, T. (2010). Cognitive load theory, educational research, and instructional design: some food for thought. <i>Instructional science</i> , 38(2), 105-134.
Week 7 (October 20, 2016)	Cognitive Load Continued De Jong, T. (2010). Cognitive load theory, educational research, and instructional design: some food for thought. <i>Instructional</i>

	<p><i>science</i>, 38(2), 105-134.</p> <p>Larkin, J. H., & Simon, H. A. (1987). Why a diagram is (sometimes) worth ten thousand words. <i>Cognitive science</i>, 11(1), 65-100.</p>
Week 8 (October 27, 2016)	Review Class
Week 9 (November 3, 2016)	<p>Representation and Comprehension</p> <p>Kintsch, W., & Van Dijk, T. A. (1978). Toward a model of text comprehension and production. <i>Psychological review</i>, 85(5), 363.</p> <p>Palincsar, A. S., & Brown, A. L. (1984). Reciprocal teaching of comprehension-fostering and comprehension-monitoring activities. <i>Cognition and Instruction</i>, 1(2), 117–175. Retrieved from http://www.jstor.org/stable/3233567</p> <p>Singer, M. (1973). A replication of Bransford and Franks' (1971) "The abstraction of linguistic ideas". <i>Bulletin of the Psychonomic Society</i>, 1(6), 416-418.</p> <p>OPTIONAL:</p> <p>Ericsson, K. & Simon, H. (1990). Verbal Protocols as Data.</p> <p>Rumelhart, D. E., & Ortony, A. (1977). The representation of knowledge in memory. In R. C. Anderson, R. J. Spiro, & W. E. Montague (Eds.), <i>Schooling and the acquisition of knowledge</i> (pp. 99–135). Hillsdale, NJ: Lawrence Erlbaum Associates.</p>
Week 10 (November 17, 2016)	<p>Situated Cognition</p> <p>Anderson, J.R., Reder, L. M., & Simon, H. A. (1996). Situated learning and education. <i>Educational Researcher</i>, 25(4), 5-11.</p> <p>Bereiter, C. (1997). Situated cognition and how to overcome it. In D. Kirshner & J. A. Whitson (Eds.), <i>Situated cognition: Social, semiotic, and psychological perspectives</i> (pp. 281-300). Hillsdale, NJ: Erlbaum</p> <p>Collins, A., & Kapur, M. (2014). Cognitive apprenticeship. In K. Sawyer (Ed.), <i>Cambridge handbook of the learning sciences</i> (pp. 109). New York, NY: Cambridge University Press.</p> <p>OPTIONAL:</p> <p>Greeno, J.G., & Engestrom, Y. (2014). Learning in Activity. In K. Sawyer (Ed.), <i>Cambridge handbook of the learning sciences</i> (pp. 128). New York, NY: Cambridge University Press.</p>
Week 11 (November 24, 2016)	NO CLASS (Thanksgiving Break)
Week 12 (December 1, 2016)	<p>Transfer</p> <p>Bransford, J., & Schwartz, D. (1999). Rethinking transfer: A simple proposal with multiple implications. <i>Review of Research in Education</i>, 24, 61–100. Retrieved from http://www.jstor.org/stable/1167267</p> <p>Lobato, J. (2006). Alternative perspectives on the transfer of learning: History, issues, and challenges for future research. <i>The Journal of the Learning Sciences</i>, 15(4), 431-449.</p> <p>Journal of the Learning Sciences disagreement papers</p>

<p>Week 13 (December 8, 2016)</p>	<p><i>Instructional Theories</i> Bruner, J. S. (1966). <i>Toward a theory of instruction</i> (Vol. 59). Harvard University Press. Koedinger, K. R., Corbett, A. T., & Perfetti, C. (2012). The Knowledge-Learning-Instruction (KLI) framework: Bridging the science-practice chasm to enhance robust student learning. <i>Cognitive Science</i>, 36(5), 757–798. doi: 10.1111/j.1551-6709.2012.01245.x Voss, J. F. (1978). Cognition and instruction: Toward a cognitive theory of learning. In <i>Cognitive psychology and instruction</i> (pp. 13-26). Springer US.</p>
<p>Week 14 (December 15, 2016)</p>	<p><i>Presentations</i></p>
<p>Week 15 (December 22, 2016)</p>	<p><i>Presentations/Test</i></p>

Presentation Topics:

- Representation and Expertise: Na'ama
- Comprehension: Rachel
- Situated Cognition: Brandon
- Transfer: Danielle
- Mental Models: Veronica