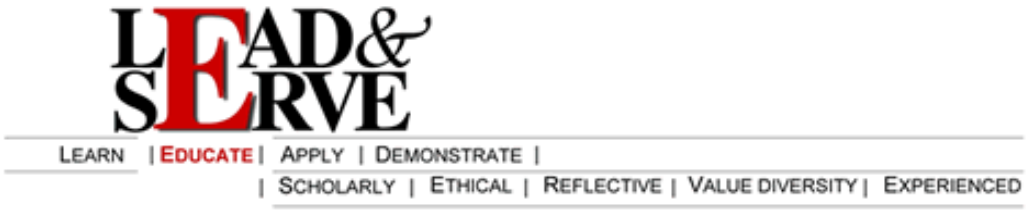

LEAD and SERVE constitute the conceptual framework for all programs for professional educators at North Carolina State University. They are the touchstones that assure that our students graduate with the following:

- **LEAD: four forms of knowledge; general pedagogy, content-specific pedagogical strategies, content or discipline knowledge as well as knowledge of the context of education, including foundations, historical perspectives and school settings.**

- **SERVE: elements that show the range of skills and dispositions developed in our candidates; scholarly, ethical, reflective, valuing diversity and experienced in practical application of knowledge.**

COURSE INFORMATION

Course Prefix and Title
ED 795-002, *Learning Sciences: Theories, Concepts, and Environments*

Instructor Information

Jimmy Scherrer, Ph.D.
317B Poe Hall
jscherr@ncsu.edu

Office Hours:
Wednesdays 3:30-5:30
or by appointment

Course Description
Beyond a general introduction to the field of learning sciences, this course mainly focuses on how environments—including the people, technologies, and interactions within them—enable or constrain opportunities to learn and identify. We will use current theories and concepts that are of interest to the learning sciences to help us decide how environments should be designed so that the actors who interact in them can do what it is that we want them to do. For example:

- *How should classrooms be designed—and teachers teach—if we want students to think and reason in a certain way?*
- *How should an organization design its work environment to foster creativity and innovation?*
- *How should we design incentive systems that motivate workers, students, and teams?*
- *How can technology be used to create an environment that enables opportunities for identity formation and identity expression?*

We will spend the first half of each class session discussing research on a specific perspective, theory, or concept. During the second half, a group of participants will present a learning environment that they have designed using the research we have been discussing. The rest of the participants will debate how the environment enables or constraints learners' ability to be

a legitimate peripheral participant in a given practice. The environments that we will discuss include, but are not limited to, (1) traditional brick-and-mortar school environments; (2) "informal learning" environments, such as museums; (3) online environments; (4) traditional workplace environments, such as school districts; and (5) innovative workplace environments, such as Google.

The purpose of the class discussions is not to come to consensus on how to design various learning environments. And I am certainly not going to give any "answers" at the end of each class (I do not have any to give). Rather, by participating in these discussions and supporting your contributions with the research we read, I believe you will realize the following goals.

Goals of the Course

As an introductory course in the learning sciences, I have some broad goals:

- Become familiar with some of the journals learning scientists read.
- Become familiar with some of the central "actors" in the learning sciences.
- Articulate some differences between learning scientists and researchers with similar interests, such as instructional designers and educational psychologists.
- Begin to understand the general beliefs and fundamental commitments that are shared among learning scientists.
- Become familiar with the history of the learning sciences and the literature base that current work builds upon.
- Become aware of learning sciences communities, such as ISLS and NAPLeS.

In sum, I hope as a result of this course you know how, if desired, to move from legitimate peripheral participation to more full participation in the learning sciences. Another goal of this course is that you will come to understand what that last sentence means.

I also have some specific goals related to your research:

- Discriminate different learning perspectives and be able to articulate affordances and limitations of each for your specific research questions.
- Achieve coherence and consistency (regardless of the learning perspective) between your research questions, your methods, and your conclusions.
- Examine how traditional notions of intelligence, expertise, and so on, that are a part of your research (or the research that you read) change when learning and cognition are considered to be inherently situated.
- Identify the presuppositions in your (and others) research questions, and state different presuppositions and research questions that are consistent with the situative perspective.

Required Course Text

Lave, J. & Wenger, E. (1991). *Situated learning: legitimate peripheral participation*. New York, NY: Cambridge University Press.

Topics
The topics we will be discussing are not discrete—common theories and concepts will be present in all "topics." Labeling the weeks in this manner simply helps frame our discussions.

Week 1. Introduction to the Learning Sciences: Past, Present, and Future
Week 2. Perspectives on Learning: Behaviorist and Cognitivist
Week 3. Perspectives on Learning: Situated
Week 4. Perspectives on Learning: Cognitive Apprenticeship
Week 5. Perspectives on Learning: Learning in Activity
Week 6. Distributed Cognition
Week 7. Cognition in Practice
Week 8. Expertise: Individual and Group
Week 9. Creativity and Innovation
Week 10. Identity (1)
Week 11. Identity (2)
Week 12. Gaming, Identity, and Learning
Week 13. Introduction to Design Research
Week 14. Introduction to Design-Based Implementation Research
Week 15. Summary: Cognition and Learning from Three Perspectives

Meeting Time and Location
Wednesdays 12:25-3:15, Poe Hall 417

Number of Credits
3

Grading (see separate document for assignment descriptions)

Participation in class discussions	75%
Presentation on a specific learning environment design	10%
Research brief	15%

COURSE READINGS

At the end of each "topic" a list of "additional readings" is given. This list is meant to help the group that will be presenting on that topic. The list is not exhaustive, and at the end of each topic I will briefly explain why each of the "additional readings" was selected.

Week 1: Introduction to the Learning Sciences
Reading for class (week 1)

Kolodner, J. (2004). The learning sciences: past, present, and future. *Educational Technology: The Magazine for Managers of Change in Education, 44*(3), 37-42.

Pages 13-24 in:
Lave, J. & Wenger, E. (1991). *Situated Learning: legitimate peripheral participation*. New York, NY: Cambridge University Press.

Weeks 2, 3, 4, and 5: Perspectives on Learning

Readings for Behaviorist and Cognitivist (week 2)

Skinner, B. F. (1954). The science of learning and the art of teaching. *Harvard Educational Review*, 86-97.

Chomsky, N. (1959). A review of B. F. Skinner's Verbal Behavior. *Language, 35*(1), 25-58.

Readings for Situated (week 3)

Chapters 1 & 2 (pp. 29- 58) in:
Lave, J. & Wenger, E. (1991). *Situated Learning: legitimate peripheral participation*. New York, NY: Cambridge University Press.

Resnick, L.B. (1996). Situated rationalism: the biological and cultural foundations for learning. *Prospects, 26*(1), 37-53.

Reading for Cognitive Apprenticeship (week 4)

Chapter 3 (pp. 61- 87) in:
Lave, J. & Wenger, E. (1991). *Situated Learning: legitimate peripheral participation*. New York, NY: Cambridge University Press.

pp. 3-18 in:
Rogoff, B. (1990). Apprenticeship in thinking: cognitive development in social context. New York, NY: Oxford University Press.

Collins, A. & Kapur, M. (2014). Cognitive apprenticeship. In K. Sawyer (Ed.), *The Cambridge Handbook of the Learning Sciences, 2nd Edition* (pp. 109-127). New York, NY: Cambridge University Press.

Reading for Learning in Activity (week 5)

Brown, J.S., Collins, A. & Duguid, P. (1989). Situated cognition and the culture of learning. *Educational Researcher, 18*(1), 32-42.

Greeno, J. & Engeström, Y. (2014). Learning in activity. In K. Sawyer (Ed.), *The Cambridge Handbook of the Learning Sciences, 2nd Edition* (pp. 128-149). New York, NY: Cambridge University Press.

Scherrer, J. (2015). Learning, teaching, and assessing the standards for mathematical practice. In C. Suurtamm (Ed.), *Annual Perspectives in Mathematics Education: Assessment to Enhance Teaching and Learning* (pp. 199-208). Reston, VA: National Council of Teachers of Mathematics.

For more on perspectives of learning and knowledge building, see the following:

Barab, S. & Plucker, J. (2002). Smart people or smart contexts? Cognition, ability, and talent development in an age of situated approaches to knowing and learning. *Educational Psychologist, 37*(3), 165-182.

Barker, R. (1968). *Ecological psychology: concepts and methods for studying the environment of human behavior*. Stanford, CA: Stanford University Press.

Bransford, J., Vye, N., Stevens, R., et al. (2006). Learning theories and education: toward a decade of synergy. In P. Alexander & P. Winne (Eds.), *Handbook of Educational Psychology, 2nd Edition* (pp.209-244). Mahwah, NJ: Erlbaum.

Chomsky, N. (2006). *Language and mind, 3rd Edition*. New York, NY. Cambridge University Press.

Cussins, A. (1992). Embodiment and objectivity: The theory of cognitive trails. *Mind, 101,* 651-688.

Engeström, Y., Miettinen, R. & Punamäki, R. (1999). *Perspectives on activity theory*. New York, NY: Cambridge University Press.

Gagné, R. (1968). Learning hierarchies. *Educational Psychologist, 6*(1), 1-9.

Goodman, J. (2013). Character Management Organizations and the Regulated Environment: Is it worth the prize? *Educational Researcher*, *42*(2), 89-96.

Greeno, J. (2011). A situative perspective on cognition and learning in interaction. In T. Koschmann (Ed.), *Theories of learning and studies of Instructional Practice* (pp. 41-72). Springer.

Hay, K. & Barab, S. (2001). Constructivism in practice: a comparison and contrast of apprenticeship and constructionist learning environments. *Journal of the Learning Sciences, 10*(3), 281-322.

James, W. (1890). *Principles of psychology*. New York, NY: Holt.

Kafai, Y. (2006). Constructionism. In K. Sawyer (Ed.), *The Cambridge Handbook of the Learning Sciences* (pp. 35-46). New York, NY: Cambridge University Press.

Kohn, A. (1993). *Punished by rewards: The trouble with gold stars, incentive plans, A's, praise and other bribes*. Boston, MA: Houghton Mifflin.

Mead, G.H. (1934). *Mind, self, and society from the standpoint of a social behaviorist*. Chicago, IL: The University of Chicago Press.

Piaget, J. & Inhelder, B. (1969). *The psychology of the child*. New York: Basic Books.

Piattelli-Palmarini, M. (Ed.) (1980). *Language and learning: the debate between Jean Piaget and Noam Chomsky*. Cambridge, MA: Harvard University Press.

Resnick, L.B., Levine, J. & Teasley, S. (1991). *Perspectives on socially shared cognition* (pp.63- 82). Washington, DC: American Psychological Association.

Siegler, R. S. (1998). *Children's thinking*. Englewood Cliffs, NJ: Prentice-Hall.

Skinner, B. F. (1958). Teaching machines. *Science, 128*, 969-977.

Thorndike, E. (1905). *The Elements of psychology*. New York, NY: Seiler.

von Glasersfeld, E. (1989). Cognition, construction of knowledge, and teaching. *Synthese, 80*, 121-140.

Vygotsky, L. S. (1978). *Mind in society: The development of higher psychological processes*. Cambridge, MA: Harvard University Press.

Watson, J. (1914). *Behavior: an introduction to comparative psychology*. New York, NY: Holt.

Week 6: Distributed Cognition

Reading for class:

Pea, R. (1993). Practices of distributed intelligence and design for education. In G. Salomon (Ed), *Distributed cognitions: psychological and educational considerations* (pp. 47-87). New York, NY: Cambridge University Press.

Spillane, J., Reiser, B., & Gomez, L. (2006). Policy implementation and cognition: the role of human, social, and distributed cognition in framing policy implementation. In M. Honig (Ed.), *New directions in education policy implementation: confronting complexity* (pp.25-46). Albany, NY: State University of New York Press.

For more on Distributed Cognition, see the following:

Bell, P. & Winn, W. (2000). Distributed cognitions, by nature and by design. In D. Jonassen & S. Land (Eds.), *Theoretical foundations of learning environments* (pp. 123-145). Mahwah, NJ: Lawrence Erlbaum Associates.

Cole, M. & Engeström, Y. (1993). A cultural-historical approach to distributed cognition. In G. Salomon (Ed), *Distributed cognitions: psychological and educational considerations* (pp. 1-46). New York, NY: Cambridge University Press.

Hollan, J., Hutchins, E. & Kirsh, D. (2000). Distributed cognition: toward a new foundation for human-computer interaction research. *ACM Transactions on computer-human interaction, 7*(2), 174-196.

Hutchins, E. (1995). *Cognition in the wild*. Cambridge, MA: MIT Press.

Hutchins, E. (1996). Distributed cognition in an airline cockpit. In Y. Engeström & D. Middleton, D. (Eds.), *Cognition and communication at work* (pp. 15-34). New York, NY: Cambridge University Press.

Michaelian, K. & Sutton, J. (2013). Distributed cognition and memory research: history and current direction. *Review of Philosophy and Psychology, 4*, 1-24.

Pea, R. (1996). Seeing what we build together: Distributed multimedia learning environments for transformative communication. In T. Koschmann (Ed.), *CSCL: Theory and practice of an emerging paradigm* (pp. 171–186). Mahwah, NJ: Lawrence Erlbaum.

Week 7: Cognition in Practice

Reading for class:

Lave, J., Murtaugh, M., & de la Rocha, O. (1984). The dialectic of arithmetic in grocery shopping. In B. Rogoff & J. Lave (Eds.), *Everyday cognition: development in social context* (pp. 67–94). Cambridge, MA: Harvard University Press.

Scribner, S. (1984). Studying working intelligence. In B. Rogoff & J. Lave (Eds.), *Everyday cognition: its development in social context* (pp.9-40). Cambridge, MA: Harvard University Press.

For more on Cognition in Practice, see the following:

Dreier, O. (2008). *Psychotherapy in everyday life*. New York, NY: Cambridge University Press.

Goodwin, C. & Goodwin, M. (1996). Seeing as a situated activity: formulating planes. In Y. Engeström & D. Middleton, D. (Eds.). *Cognition and communication at work* (pp. 61-95). New York, NY: Cambridge University Press.

Lave, J. (1988). *Cognition in practice: mind, mathematics, and culture in everyday life*. New York, NY: Cambridge University Press.

Nunes, T., Schliemann, A., & Carraher, D. (1993). *Street mathematics and school mathematics*. New York, NY: Cambridge University Press.

Resnick, L.B. (1987). Learning in school and out. *Educational Researcher, 16*(9), 13-20+54.

Rogoff, B. & Lave, J. (1984). *Everyday cognition: development in social context*. Cambridge, MA: Harvard University Press.

Rose, M. (2001). The working life of a waitress. *Mind, Culture & Activity*, 8(1), 3-27.

Saxe, G. (1988). Candy selling and math learning. *Educational Researcher, 17*, 14-21

Suchman, L. (2007). *Human-machine reconfigurations: plans and situated actions*. New York, NY: Cambridge University Press.

Week 8: Expertise: Individual and Group

Reading for class:

pp. 31-50 (Chapter 2) in:
Bransford, J., et al. (2000). *How people learn: brain, mind, experience, and school*. Washington, DC: National Academy Press.

Choose one of the following:
a) Groysberg, B., Lee, L. & Nanda, A. (2008). Can they take it with them? The portability of star knowledge workers' performance. *Management Science, 54*(7), 1213-1230.

b) Huckman, R. & Pisano, G. (2006). The firm specificity of individual performance: evidence from cardiac surgery. *Management Science, 52*(4), 473-488.

c) Huckman, R., Staats, B. & Upton, D. (2009). Team familiarity, role experience, and performance: evidence from Indian software services. *Management Science, 55*(1), 85-100.

Read last:
Scherrer, J. (2015). The situated and distributed nature of teacher effectiveness: challenging current theories of education accountability and the presuppositions they carry. *Public Schools First NC Scholars' Corner*, 1-6.

For more on expertise, see the following:

Burton, R., Brown, J.S., & Fischer, G. (1984). Skiing as a model of instruction. In B. Rogoff & J. Lave (Eds.), *Everyday cognition: development in social context* (pp. 139–94). Cambridge, MA: Harvard University Press.

Dreyfus, H. & Dreyfus, S. (1986). *Mind over machine*. New York, NY: The Free Press.

Engeström, Y. (1996). The tensions of judging: handling cases of driving under the influence of alcohol in Finland and California. In Y. Engeström & D. Middleton, D. (Eds.). *Cognition and communication at work* (pp. 199-232). New York, NY: Cambridge University Press.

Ericsson, K., Charness, N., Feltovich, P. & Hoffman, R. (Eds.) (2006). *The Cambridge handbook on expertise and expert performance*. New York, NY: Cambridge University Press.

Laufer, E. & Glick, J. (1996). Expert and novice differences in cognition and activity: a practical work activity. In Y. Engeström & D. Middleton, D. (Eds.). *Cognition and communication at work* (pp. 177-198). New York, NY: Cambridge University Press.

Nokes, T. & Schunn, C. (2011). Problem solving and human expertise. In V. ver Aukrust (Ed.), *Learning and cognition* (pp. 104-111). Elsevier.

Shreiner, T. (2014). Using historical knowledge to reason about contemporary political issues: an expert-novice study. *Cognition and Instruction, 32*(4), 313-352.

Week 9: Creativity and Innovation

Reading for class:

Birch, H. & Rabinowitz, H. (1951). The negative effect of previous experience on productive thinking. *Journal of Experimental Psychology, 41*(2), 121-125.

pp. 7-10 and pp. 211-223 in:
Sawyer, K. (2012). *Explaining creativity: the science of human innovation*. New York, NY: Oxford University Press.

Vygotsky, L. (2004). Imagination and creativity in childhood. *Journal of Russian and East European Psychology, 42*(1), 7-97.

For more on creativity and innovation, see the following:

Amabile, T. & Pillemer, J. (2012). Perspectives on the social psychology of creativity. *The Journal of Creative Behavior, 46*(1), 3-15.

Burt, R. (2004). Structural holes and good ideas. *American Journal of Sociology, 110*, 349-399.

Daniels, H., Leadbetter, J., Soares, A., & MacNab, N. (2007). Learning in and for cross-school working. *Oxford Review of Education, 33*(2), 125-142.

Dashiell, J. (1945). On problem-solving. *Psychological monographs, 58(5).*

Hennessey, B. & Amabile, T. (2010). Creativity. *Annual Review of Psychology, 61*, 569-598.

Isaacson, W. (2014). *The innovators: how a group of hackers, geniuses, and geeks created the digital revolution*. New York, NY: Simon & Schuster.

Kelly, T. & Kelly, D. (2013). *Creative confidence: unleashing the creative potential within us all*. New York, NY: Crown Business.

Levy, S. (2011). *In the plex: how Google thinks, works, and shapes our lives*. New York, NY: Simon & Schuster

Luchins, A. (1942). Mechanization in problem solving: the effect of einstellung. *Psychological Monographs, 54*(6).

Maltzman, I. (1960). On the training of originality. *Psychological Review, 67*(4), 229-242.

Moolenaar N. et al. (2014). Linked to innovation: shaping an innovative climate through network intentionality and educators' social network position. *Journal of Educational Change, 15*, 99-123.

Robinson, K. (2001). *Out of our minds: learning to be creative*. West Sussex, England: Capstone.

West, M. (2002). Sparkling fountains or stagnant ponds: an integrative model of creativity and innovation implementation in work groups. *Applied Psychology: An International Review, 51*(3), 355-424.

Young, J. *A technique for producing ideas*. (these are notes presented to his graduate students at the University of Chicago. They can easily be found online)

Weeks 10 and 11: Identity

Reading for Class (week 10)

pp. 62-71 in:
Appiah, K. (2005). *The ethics of identity*. Princeton, NJ: Princeton University Press.

pp. 312-315 in:
Wetherell, M. (1996). *Identities, groups, and social issues*. Thousand Oaks, CA: Sage.

Chapters 4 and 5 (pp. 91-123) in:
Lave, J. & Wenger, E. (1991). *Situated Learning: legitimate peripheral participation*. New York, NY: Cambridge University Press.

Reading for Class (week 11)

pp. 1-6 in:
Sen, A. (2006). *Identity & violence: the illusion of destiny*. New York, NY: Penguin.

pp. 143-165 (Chapter 5) in:
Appiah, K. (2014). *Lines of descent: W.E.B. Du Bois and the emergence of identity*. Cambridge, MA: Harvard University Press.

Gino, F., Ayal, S., & Ariely, D. (2009). Contagion and differentiation in unethical behavior: the effect of one bad apple on the barrel. *Psychological Science, 20*(3), 393-398.

For more on Identity, see the following:

Becker, H. (1953). Becoming a marihuana user. *American Journal of Sociology*, 59, 235-242.

Becker, H. & Carper, J. (1956). The elements of identification with an occupation. *American Sociological Review, 21*(3), 341-348.

Cassell, J. (1999). Storytelling as a nexus of change in the relationship between gender and technology: a feminist approach to software design. In J. Cassell & H. Jenkins (Eds.) *From Barbie to Mortal Kombat: gender and computer games*. Cambridge, MA: MIT Press.

Cisneros, S. (1984). *The house on Mango Street*. New York, NY: Vintage.

Dweck, C. (2006). Is math a gift? Beliefs that put females at risk. In S. Ceci & W. Williams (Eds.), *Why aren't more women in science? Top researchers debate the evidence*. Washington, DC: American Psychological Association.

Eckert, P. (1989). *Jocks and Burnouts: Social Categories and Identity in the High School.* New York, NY: Teachers College Press.

Eckert, P. & Wenger, E. (1994). *From school to work: an apprenticeship in institutional identity*. Working Papers on Learning and Identity. Palo Alto, CA: Institute for Research on Learning

Erikson, E. (1968). *Identity: youth and crisis*. New York, NY: Norton.

Fleischman, P. (1997). *Seedfolks*. New York: NY: Harper Trophy.

Gee, J. (2001). Identity as an analytic lens for research in education. *Review of Research in Education, 25*, 99-125.

Giddens, A. (1991). *Modernity and self-identity: self and society in the late modern age*. Palo Alto, CA: Stanford University Press.

Gleason, P. (1983). Identifying identity: a semantic history. *The Journal of American History, 69*(4), 910-931.

Gutmann, A. (2003). *Identity in democracy*. Princeton, NJ: Princeton University Press

Holland, D., Lachicotte, W., Skinner, D., & Cain, C. (1998). *Identity and agency in cultural worlds*. Cambridge, MA: Harvard University Press.

Levine, M., Prosser, A., Evans, D., & Reicher, S. (2005). Identity and emergency intervention: how social group membership and inclusiveness of group boundaries shape helping behavior. *Personality and Social Psychology Bulletin*, *31*(4), 443-453.

Nasir, N. & Hand, V. (2008). From the court to the classroom: opportunities for engagement, learning, and identity in basketball and classroom mathematics. *Journal of the Learning Sciences, 17*, 143-179.

Nettleford, R. (1970). *Mirror, mirror: identity, race and protest in Jamaica*. Jamaica: William Collins and Sangster Publishing.

Penuel, W. & Wertsch, J. (1995). Vygotsky and identity formation: a sociocultural approach. *Educational Psychologist, 30*(2), 83-92.

Sfard, A. & Prusak, A. (2005). Telling identities: in search of an analytic tool for investigating learning as a culturally shaped activity. *Educational Researcher, 34*, 14

Santiago, E. (1993). *When I was Puerto Rican*. New York, NY: Vintage.

Strauss, A. (1959). *Mirror and masks: the search for identity*. Glencoe, IL: Free Press

Strauss, A. (1995). Identity, biography, history, and symbolic representations. *Social Psychology Quarterly, 58*(1), 4-12.

Sullivan, F. & Wilson, N. (2015). Playful talk: negotiating opportunities to learn in collaborative groups. *Journal of the Learning Sciences, 24*(1), 5-52.

Vagan, A. (2011). Towards a sociocultural perspective on identity formation in education. *Mind, Culture, and Activity, 18*, 43-57.

Wenger, E. (1998). *Communities of practice: learning, meaning, and identity*. New York, NY: Cambridge University Press.

Wetherell, M. (1996). *Identities, groups, and social issues*. Thousand Oaks, CA: Sage

Wortham, S. (2006). *Learning identity: the joint emergence of social identification and academic learning*. New York, NY: Cambridge University Press.

Week 12: Gaming, Identity, and Learning

Reading for Class:

Barab, S., Gresalfi, M. & Ingram-Goble, A. (2010). Transformational play: using games to position person, content, and context. *Educational Researcher, 39*(7), 525-536.

Squire, K. (2006). From content to context: Videogames as designed experiences. *Educational Researcher, 35*(8), 19–29.

Steinkueler, C. & Squire, K. (2014). Videogames and Learning. In K. Sawyer (Ed.), *The Cambridge Handbook of the Learning Sciences, 2nd Edition* (pp. 377-395). New York, NY: Cambridge University Press.

For more on Gaming, Identity, and Learning, see the following:

Gee, J. P. (2003). *What Video Games Have to Teach Us About Learning*. New York, NY: Palgrave

Gee, J. P. (2004). *Language, Learning, and Gaming. A Critique of Traditional Schooling*. New York, NY: Routledge.

Ito, M., et al. (2010). *Hanging out, messing around, and geeking out: kids living and learning with new media*. Cambridge, MA: MIT Press.

Neulight, N. Kafai, Y., Kao, L., Foley, B. & Galas, C. (2007). Children's participation in a virtual epidemic in the science classroom: making connections to natural infectious diseases. *Journal of Science Education and Technology, 16*(1), 47-58.

Salen, K. & Zimmerman, E. (2006). *The game designer reader: a rules of play anthology*. Cambridge, MA: MIT Press.

Squire, K., Giovanetto, L., Devane, B. & Durga, S. (2005). From users to designers: building a self-organizing game-based learning environment. *TechTrends, 49*(5), 34-42.

Squire, K.& Jan, M. (2007). Mad City Mystery: developing scientific argumentation skills with a place-based augmented reality game on handheld computers. *Journal of Science Education and Technology, 16*(1), 5-29.

Steinkuehler, C. A. (2006). Massively multiplayer online videogaming as participation in a Discourse. *Mind, Culture, & Activity*, *13*(1), 38–52.

Steinkuehler, C., Squire, K., & Barab, S. (2012). Games, learning, and society: learning and meaning in the digital age. New York, NY: Cambridge University Press.

Steinkuehler, C. & Williams, D. (2006). Where everybody knows your (screen) name: online games as "third places". *Journal of Computer-Mediated Communication, 11*, 885-090.

Thomas, D. & Brown, J. S. (2011). *A new culture of learning: cultivating the imagination for a world of constant change*. Lexington, KY: Author.

Week 13: Introduction to Design Research

Readings for Class:

Brown, A. (1992). Design experiments: theoretical and methodological challenges in creating complex interventions in classroom settings. *Journal of the Learning Sciences, 2*, 141-178.

Barab, S. (2014). Design-based research: a methodological toolkit for engineering change. In K. Sawyer (Ed.), *The Cambridge Handbook of the Learning Sciences, 2nd Edition* (pp. 151-170). New York, NY: Cambridge University Press.

Week 14: Introduction to Design-Based Implementation Research

Readings for Class:

Penuel, W., Fishman, B., Cheng, B. & Sabelli, N. (2011). Organizing research and development at the intersection of learning, implementation, and design. *Educational Researcher, 40*(7), 331-337.

Scherrer, J., Israel, N. & Resnick, L.B. (2013). Beyond classrooms: scaling and sustaining instructional innovations. *National Society for the Study of Education, 112*(2), 426-442.

For more on Design Research, see the following:

Cole, M. et al. (2014). Toward an argumentative grammar for socio-cultural/cultural-historical activity approaches to design research. In J.L. Polman, E.A. Kyza, D.K. O'Neill, I. Tabak, W.R. Penuel, S. Jurow, K. O'Connor, T. Lee, & L. D'Amico (Eds*.). Learning and becoming in practice: The International Conference of the Learning Sciences (ICLS) 2014, Volume 3*. Boulder, CO: International Society of the Learning Sciences.

Collins, A. (1992). Towards a design science of education. In E. Scanlon & T. O'Shea (Eds.), *New directions in educational technology* (pp. 15-22). Berlin, Germany: Springer.

Collins, A. Joseph, D. & Bielaczyc, K. (2004) Design research: Theoretical and methodological issues. *Journal of the Learning Sciences*, 13(1), 15-42.

Confrey, J. (2006). The evolution of design studies as methodology. In K. Sawyer (Ed.), *The Cambridge Handbook of the Learning Sciences* (pp. 135-151). New York, NY: Cambridge University Press.

Downing-Wilson, D., Lecusay, R. & Cole, M. (2011). Design experimentation and mutual appropriation: two strategies for university/community collaborative after-school interventions. *Theory and Psychology, 21*(5), 656-680.

Engeström, Y. (2011). From design experiments to formative interventions. *Theory and Psychology, 21*(5), 598-628.

Nicolopoulou, A. & Cole, M. (2010). Design experimentation as a theoretical and empirical tool for development pedagogical research. *Pedagogies, 5*(1), 61-71.

Sandoval, W. (2014). Conjecture mapping: an approach to systematic educational design research. *Journal of the Learning Sciences, 23*, 18-36.

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Week 15: Summary: Cognition and Learning from Three Perspectives
Reading for Class:

Greeno, J., Collins, A. & Resnick, L. (1996). Cognition and learning. In D. Berliner & R. Calfee (Eds.), *Handbook of educational psychology* (pp. 15-46). New York, NY: MacMillan.

For more on Perspectives of Cognition and Learning, see the following:

Barab, S. & Duffy, T. (2000). From practice fields to communities of practice. In D. Jonassen & S. Land (Eds.), *Theoretical foundations of learning environments* (pp. 25-55). Mahwah, NJ: Lawrence Erlbaum Associates.

Case, R. (1992). Neo-Piagetian theories of child development. In R. Sternberg & C. Berg (Eds.), *Intellectual Development* (pp. 161-196). New York, NY: Cambridge University Press.

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UNIVERSITY INFORMATION

Communication Policy
It is easiest to communicate with me through email: jscherr@ncsu.edu. Note, as per university policy, I must send all messages to your NCSU email account. Further, as per university policy, all students are required to check their NCSU email account on a regular basis for course communication and updates.

Everyday I set aside a block of time to read (and respond to) email. On most days, I get through most emails. However, there are some days when I cannot attend to all messages. If you do not hear back from me in 48 hours, do not hesitate to send me the message again.

Course Evaluations
Online course evaluations will be available to complete during the last two weeks of class. You will receive an email message with a link to a website where you can login using your Unity ID and complete evaluations. All evaluations are confidential; instructors will never know how any one student responded to any one question, and students will never know the ratings for any particular instructor.

Academic Integrity
Students are required to uphold the university pledge of honor and exercise honesty in completing course work. Details of the academic integrity policy can be found in the Code of Student Conduct: http://policies.ncsu.edu/policy/pol-11-35-01

Accommodations

Accommodations will be made for students who need them. Students are encouraged to register with *Disability Services for Students* to gain access to a range of resources: http://dso.dasa.ncsu.edu

Supporting Fellow Students in Distress

As members of the North Carolina State University community, we each share a personal responsibility to express concern for one another and to ensure that this classroom and the campus as a whole remains a safe environment for learning. Occasionally, you may come across a fellow classmate whose personal behavior concerns or worries you. When this is the case, I encourage you to report this behavior to the NC State Students of Concern website: http://studentsofconcern.ncsu.edu/. Although you can report anonymously, it is preferred that you share your contact information so they can follow-up with you personally.

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Young, J. *A technique for producing ideas*. (these are notes presented to his graduate students at the University of Chicago. They can easily be found online)