DARTMOUTH COLLEGE
EDUCATION 01
INTRODUCTION TO EDUCATION: LEARNING, DEVELOPMENT, AND TEACHING

General Information

Professor: Michele Tine
Email: michele.tine@dartmouth.edu
Office: Raven House 211
Class Time: (10A slot) Tuesday & Thursday, 10:10-12:00
X-hour: Wednesday 3:30-4:20
Office Hours: Tuesday 12:30-2:30 and by appointment
Location: Moore Hall, Filene Auditorium

Course Description

Education, development, and learning are inextricably intertwined. In this course, we will explore how pre-Kindergarten through high school education is informed by scientific evidence across multiple domains. Topics to be explored may include the educational system in America; the research-to-practice gap and educational misconceptions; social, emotional, and motivational development in school context; memory, strategies, metacognition, and assessment as related to learning; and learning and teaching in early math, science, and reading.

Course Goals

- To not only become familiar with, but also begin to develop a deeper understanding of, a wide range of concepts related to learning, development, and teaching.

- To begin to apply interdisciplinary, empirical evidence to construct and use your own model of learning, development, and teaching.

Course Requirements

1. Readings
There is no textbook for this class. Course readings have been carefully selected to help you build a knowledge base concerning learning, development, and teaching – to which we will add to in class. Therefore, it is required that you complete all readings before each class meeting. All readings are available through the course Canvas site.

2. Attendance and Participation
Class attendance and participation are expected. They are fundamental to learning. Share responsibility for including all voices in the discussion by being aware of how much space you take up in class. If you often have much to say, try to hold back a bit and allow space for others; if you are hesitant to speak, look for opportunities to contribute to the discussion. Please note: if you must miss a class, it is your responsibility to complete the readings, borrow notes from a classmate, review the power point slides, and acquire any other materials used that day.

3. Research Study Assignment

Participating in an education research study will allow you to reflect on where evidence comes from and how it is collected, by experiencing (or imagining) what it is like to provide that evidence. This assignment can be submitted to me any time before our last class meeting. However, I strongly encourage you to complete the assignment well before the end of term, especially as labs can be booked by the end of term. This assignment has two options (choose only one):

> Option 1: Volunteer to participate in a research study in the Department of Education. Specific instructions are posted to Canvas on how to sign up to volunteer to participate in a research study conducted by a research lab in the Department of Education. Available labs are listed on the site; contact the one you are interested in. After you have participated in a study, complete the *EDUC01 Participant Reflection Form.* A copy of the form is posted on Canvas. Hand in your completed form to me anytime before the start of our last class meeting.
>
> Option 2: Imagine participating in a research study in the Department of Education. If you are uninterested in participating in a current research study in the Department of Education or unable to participate (many studies use exclusionary criteria that might make you ineligible), you may write a hypothetical study experience overview. First, find a published article authored by one of the faculty in the Department of Education that involved college student participants (the links to the lab websites on the Canvas site for the course will be useful). Second, complete the *EDUC01 Hypothetical Research Participation Reflection* form. A copy of the form is posted on Canvas. Hand in your completed form to me anytime before the start of our last class meeting.

4. In Class Activities

We will do four in class activities during the term. The activities are aligned with the goals of the course in that they will provide you with the opportunity to develop a deeper understanding of the topic of the day and, in doing so, allow you to construct and use your own model of learning, development, and teaching. In class, you will be randomly assigned to a small group. Your group will be provided with specific activity instructions. Each group must upload one activity response by the end of the class period. I will grade each group response. Each member of a group will receive the same grade. However, if there is agreement among the majority of a group that a member or members did not contribute meaningfully to the activity and/or response (or it is my judgment that such is the case), that member may receive a different grade. I will also ask you to read the posted activity responses from the other groups so you can benefit from their learning and they from yours.

Please note: Meaningful participation in class activities is an important component of the course. Obviously, you cannot meaningfully participate in class activities if you are not present, so there is no way to "make up" a missed activity. However, if you must miss a class, there is a one-time option to complete an alternate 2-point assignment as a replacement (this cannot be used for "extra credit" or to "make up" missed points). Please ask me for this assignment at the next class you attend following your absence; it is due 72 hours after you receive it.

5. Brief Written Assignments

There will be two brief written assignments. Aligned with the second goal of the course, they will allow you to consider the application of interdisciplinary, empirical evidence. The first starts with empirical evidence and allows you to think about its application. The second starts with applications and allows you to think about their empirical evidence basis.

Brief Assignment 1: Understanding empirical evidence- and its educational applications

The purpose of this assignment is to help you feel comfortable reading and evaluating the various components of an empirical research article, so you will be prepared to later think about how study results may (or may not) be applied. You will locate the empirical article entitled "What Does Doodling Do?" written by Jackie Andrade and answer a set of questions about the specific components of the article (e.g., abstract, introduction, methods, results, discussion). You will also provide a reflection about how the findings c/should (or c/should not) be applied. Detailed instructions are posted on Canvas. Your assignment should be a maximum of 2 pages double-spaced, so make sure every word counts.

Brief Assignment 2: Understanding educational applications- and their empirical basis

The purpose of this assignment is to consider if the necessary empirical steps have been taken before suggestions of application. First, you will need to locate a media report about a new recommendation being made in the field of education. You will find and summarize the media report. Then, you will find the original empirical article that was the basis of the recommendation and 1) assess the accuracy of the evidence-based claims made in the media article and 2) consider what further translational evidence we would be needed before being able to confidently suggest application in the field. Detailed instructions are posted on Canvas. Your assignment should be a maximum of 2 pages double-spaced, so make sure every word counts.

6. Exams

There will be two exams given in class during the term. The first exam will include content covered up to and including the class period before the exam. The second will cover content covered only after the first exam. Both will include a variety of assessment formats including multiple choice and short answer and both will be based on readings, lectures, in-class discussions, and activities.

7. Final Exam

There will also be a final exam given during finals week. It will be cumulative. The final exam will include a variety of assessment formats including multiple choice, short answer, and short essay and will be based on the readings, lectures, in-class discussions, and activities.

Course Grade Breakdown

Attendance and Participation: 2%
Research Study Assignment: 3%
In Class Activity 1: 2%
In Class Activity 2: 2%
In Class Activity 3: 2%
In Class Activity 4: 2%
Brief Assignment 1: 5%
Brief Assignment 2: 5%
Exam 1: 25%
Exam 2: 25%
Final: 27%

Late Policy

The brief assignments must be handed in at the beginning of class on the date indicated on the syllabus. Brief assignments handed in after class will be counted as one day late. **Ten percent** will be deducted from the grade if it is handed in one day late and an **additional five percent** will be deducted for each additional day that passes. You are responsible for the brief assignments even if you cannot be in class on the day they are due. If you cannot be in class, turn in the assignment to me **before** class time and it will not be counted as late. The in class activity responses are due by the end of the class period (12:00 noon) on the day we do the activity. **Ten percent** will be deducted from any response form handed in after the end of the class period. An **additional five percent** will be deducted for each additional day that passes.

Academic Honor Principle

I take the Academic Honor Principle seriously. I expect you to familiarize yourself with it and uphold it. It stated clearly at: http://www.dartmouth.edu/judicialaffairs/honor/index.html. For this course, you may not receive or provide assistance on any exam. You may not plagiarize. Plagiarism is the submission or presentation of work, in any form, that is not your own, without acknowledgment of the source. For this course, cite all sources according to the formal APA guidelines. If you have any clarification questions about how the Academic Honor Principal applies to this course, please ask me- and please do so before submitting an assignment. Any violation will result in a zero on the assignment and a referral to Judicial Affairs.

Students with Disabilities

Students with disabilities who may need disability-related academic adjustments and services for this course are encouraged to see me privately as early in the term as possible. Students requiring disability-related academic adjustments and services must consult the Student Accessibility Services office (Student.Accessibility.Services@Dartmouth.edu). Once SAS has authorized services, students must show the originally signed SAS Services and Consent Form and/or a letter on SAS letterhead to me. As a first step, if you have questions about whether you qualify to receive academic adjustments and services, you should contact the SAS office. All inquiries and discussions will remain confidential.

Religious Observances

Some of you may wish to take part in religious observances that occur during this academic term. If you have a religious observance that conflicts with your participation in the course, please meet with me at the beginning of the term to discuss appropriate accommodations.

Mental Health

I recognize that the academic environment at Dartmouth is challenging, that our terms are intensive, and that classes are not the only demanding part of your life. There are a number of resources available to you on campus to support your wellness, including:

Undergraduate deans (http://www.dartmouth.edu/~upperde/)
Counseling and Human Development (http://www.dartmouth.edu/~chd/),
Student Wellness Center (http://www.dartmouth.edu/~healthed/)

I encourage you to use these resources, and come speak with me, to take care of yourself throughout the term

Into the Future

There are many opportunities to work with elementary and secondary school students – to use what you learn in this course – while you are at Dartmouth (and beyond). You can find a list of on-campus options on the Department of Education website: http://educ.dartmouth.edu/sites/educ.dartmouth.edu/files/opportunities_to_work_with_children_and_adolescents_0.pdf.

Schedule of Topics and Due Dates

Class	Topic	Due
Thur Sept 13	Introduction to the Course	
Tue Sept 18	Overview of US Education System (Part 1)	
Thur Sept 20	Overview of US Education System (Part 2)	Brief Assignment 1
Tue Sept 25	Evidence-based Education	
Thur Sept 27	Teachers & Teaching	Activity 1
Tue Oct 2	Social Processes in L & T	
Thur Oct 4	Emotional & Self-Regulation Processes in L & T	Activity 2
Tues Oct 9	Motivational Processes in L & T	
Thur Oct 11	--*Exam 1*--	Exam 1
Tue Oct 16	Memory	
Wed Oct 17 (x-hr)	Metacognition in L & T --*Return Exam 1*--	Brief Assignment 2
Thur Oct 18	Strategies for Strengthening L & T (Part 1)	
Tue Oct 23	Strategies for Strengthening L & T (Part 2)	
Thur Oct 25	Assessing L&T	Activity 3
Tue Oct 30	--*Exam 2*--	Exam 2
Thur Nov 1	L & T Science	
Tue Nov 6	L & T Math	Activity 4
Wed Nov 7 (x-hr)	--*Return Exam 2*--	
Thur Nov 8	L & T Reading	
Tue Nov 13	Summary & Reflection	Research Participation
Mon Nov 19	--*Final Exam*--	Final Exam

Schedule of Readings

Note: Readings should be completed before each class meeting. All readings are available through the Canvas site. This schedule is subject to change.

Thursday Sept 13

Introduction to the Course

An overview of the course, a preview of some of our topics, and an opportunity to think about why we care about education.

Diamond, A. (2007). Interrelated and interdependent. *Developmental Science, 10*(1), 152-158. doi:10.1111/j.1467-7687.2007.00578.x

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Tuesday Sept 18

Overview of US Educational System (Part 1)

Structure of schooling, types of schools, international comparison, how schools are run, income-achievement gap, early intervention, the Elementary and Secondary Education Act.

U.S. Department of State. (2008). *USA education in brief, 1-41.* Retrieved from http://photos.state.gov/libraries/shanghai/135040/wangrh/education-in-brief-spread- 082708.pdf

Halpert, J. (2018, 04 March). What if America didn't have public schools? [Blog post]. Retrieved from https://www.theatlantic.com/education/archive/2018/03/what-if-america-didnt-have-public-schools/552308/

Thursday Sept 20*

Overview of the US Educational System (Part 2)

Continued: structure of schooling, types of schools, international comparison, how schools are run, income-achievement gap, early intervention, the Elementary and Secondary Education Act.

Council on School Health. (2013). The crucial role of recess in school. *Pediatrics, 131,* 183-188. doi:10.1542/peds.2012-2993

Mervis, J. (2011a). Past successes shape effort to expand early intervention. *Science, 333,* 952-956. doi:10.1126/science.333.6045.952

Mervis, J. (2011b). Giving children a head start is possible – but it's not easy. *Science, 333,* 956-957. doi:10.1126/science.333.6045.956

McGuinn, P. (2016). From No Child Left Behind to the Every Student Succeeds Act: federalism and the education legacy of the Obama administration. *Publius: The Journal of Federalism, 46*(3), 392-415. doi:10.1093/publius/pjw014

National Association of Secondary School Principals. (2016). *Every Student Succeeds Act (ESSA) overview*. Retrieved from https://www.nassp.org/advocacy/essa-toolkit/essa-facts-sheets/every-student-succeeds-act-(essa)-overview?SSO=true

Turner, C., & Kamenatz, A. (2017, 26 June). School vouchers get 2 new report cards [Blog post]. Retrieved from http://www.npr.org/sections/ed/2017/06/26/533192616/school-vouchers-get-a-new-report-card

*BRIEF ASSIGNMENT 1 DUE TODAY

Tuesday Sept 25

Evidence-based Education

Evidence: how we know what works, the research-to-practice gap, and misconceptions about learning, development, and education.

Geake, J. (2008). Neuromythologies in education. *Educational Research, 50*(2), 123-133. doi: 10.1080/00131880802082518

Howard-Jones, P. (2010). Educators on the brain, neuroscientists on education. In *Introducing Neuroeducational research: Neuroscience, education, and the brain from contexts to practice* (pp. 37-58). London: Routledge.

Davies, P. (1999). What is evidence-based education? *British Journal of Educational Studies, 47*(2), 108-121. doi:10.1111/1467-8527.00106

Slavin, R. (2017, 6 June). Research and practice: "tear down this wall" [Blog post]. Retrieved from http://www.huffingtonpost.com/entry/research-and-practice-tear-down-this-wall_us_5940daffe4b04c03fa2616c6#

Snow, C. (2015). Rigor and realism: doing educational science in the real world. *Educational Researcher, 44*(9), 460-466. doi:10.3102/0013189X15619166

Matthews, R. (2000). Storks deliver babies (p = 0.008). *Teaching Statistics, 22*(2), 36-38. doi:10.1111/1467-9639.00013

Thursday Sept 27*

Teachers and Teaching

Teachers as designers and deliverers of curriculum and creators of learning communities, backwards planning, transfer, active and passive learning, zone of proximal development, gradual release of responsibility, academic language, hidden curriculum, expectations, and certification.

Finley, T. (2014, 2 January). 8 strategies for teaching academic language [Blog post]. Retrieved from https://www.edutopia.org/blog/8-strategies-teaching-academic-language-todd-finley

Ellison, K. (2015, December). Great expectations. *Discover Magazine, 36*(10), 44-49. Retrieved from http://discovermagazine.com/2015/dec/14-great-expectations (alternate title: Being honest about the Pygmalion effect)

Hamre, B.K. (2014). Teachers' daily interactions with children: an essential ingredient in effective early childhood programs. *Child Development Perspectives, 8*(4), 223-230. doi:10.1111/cdep.12090

Tomlinson, C.A. (2012). Watching us work. *Educational Leadership, 69*(7), 92-93. Retrieved from http://web.a.ebscohost.com.dartmouth.idm.oclc.org/ehost/pdfviewer/pdfviewer?vid=2&sid=7fa604e1-3d36-429c-b3ef-faeb7b343884%40sessionmgr4009

Darling-Hammond, L. (2000). How teacher education matters. *Journal of Teacher Education, 51*(3), 166-173. doi:10.1177/0022487100051003002

Wall, C.R.G. (2016). From student to teacher: changes in preservice teacher educational beliefs throughout the learning-to-teach journey. *Teacher Development, 20*(3), 364-379. doi:10.1080/13664530.2016.1149509

*IN CLASS ACTIVITY TODAY

Tuesday Oct 2

Social Processes in Learning and Teaching

Learning through social experience, theory of mind, collaborative or cooperative learning, stereotype threat, SEL approaches.

Blakemore, S.J. (2010). The developing social brain: Implications for education. *Neuron, 65*, 744-747. doi:10.1016/j.neuron.2010.03.004

Stahl, R.J. (1994). The essential elements of cooperative learning in the classroom. ERIC Digest (ED370881, 1994-03-00). Retrieved from http://files.eric.ed.gov/fulltext/ED370881.pdf

American Psychological Association. (2006, 15 July). *Stereotype threat widens achievement gap*. Retrieved from http://www.apa.org/research/action/stereotype.aspx

Weissberg, R., Durlak, J.A., Domitrovich, C.E., & Gullotta, T.P. (2016, 15 February). Why social and emotional learning is essential for students [Blog post]. Retrieved from https://www.edutopia.org/blog/why-sel-essential-for-students-weissberg-durlak-domitrovich-gullotta

Buhs, E. S., & Ladd, G. W. (2001). Peer rejection as an antecedent of young children's school adjustment: An examination of mediating processes. *Developmental Psychology, 37,* 550-560. doi: 10.1037/0012-1649.37.4.550

Thursday Oct 4*

Emotional and Self Regulation Processes in Learning and Teaching

Emotion and self-regulation, self-esteem, the emotional context of learning, and stress.

Mischel, W., Ayduk, O., Berman, M.G., Casey, B.J., Gotlib, I.H., Jonides, J., Kross, E., Teslovich, T., Wilson, N.L., Zayas, V., & Shoda, Y. (2011). 'Willpower' over the life span: decomposing self-regulation. *Social, Cognitive, and Affective Neuroscience, 6,* 252-256. doi:10.1093/scan/nsq081

Duckworth, A.L., & Seligman, M.E.P. (2005). Self-discipline outdoes IQ in predicting academic performance of adolescents. *Psychological Science, 16*(12), 939-944. doi:10.1111/j.1467-9280.2005.01641.x

Lipsett, A-B. (2011). Supporting emotional regulation in elementary school: brain-based strategies and classroom interventions to promote self-regulation. *LEARNing Landscapes, 5*(1), 157-175. Retrieved from http://www.learninglandscapes.ca/images/documents/ll-no9/ablipsett.pdf

Blair, C. (2012). Treating a toxin to learning. *Scientific American Mind*, *23*, 64-67. doi: 10.1038/scientificamericanmind0912-64

*IN CLASS ACTIVITY TODAY

Tuesday Oct 9

Motivational Processes in Learning and Teaching

Intrinsic and extrinsic motivation, rewards, achievement motivation, and curiosity.

Dweck, C.S. (2007). Secret to raising smart kids. *Scientific American Mind, 18,* 36-43. doi:10.1038/scientificamericanmind1207-36

Center on Education Policy. (2012). Student motivation – an overlooked piece of school reform. Washington, DC: CEP. Retrieved from http://files.eric.ed.gov/fulltext/ED532666.pdf

Mizuno, K., Tanaka, M., Ishii, A., Tanabe, H., Onoe, H., Sadata, N., & Watanabe, Y. (2008). The neural basis of academic achievement motivation. *Neuroimage, 42*(1), 339-378. doi: 10.1016/j.neuroimage.2008.04.253

Engel, S. (2013). The case for curiosity. *Educational Leadership, 70*(5), 36-40. Retrieved from http://web.a.ebscohost.com.dartmouth.idm.oclc.org/ehost/pdfviewer/pdfviewer?vid=2&sid=cca46ca7-49a2-4c7e-af2d-279f55345090%40sessionmgr4009&hid=4112

Thursday Oct 11

Exam 1

Tuesday Oct 16

Memory

A model of memory, the roles of working memory and long-term memory in education, sleep and long-term memory, memory and multitasking.

Miller, M.D. (2011). What college teachers should know about memory: a perspective from cognitive psychology. *College Teaching, 59*(3), 117-122. doi: 10.1080/87567555.2011.580636

Thorne, G. (2003, 01 January). What are some problems students have with memory? [Blog post]. Retrieved from http://www.cdl.org/articles/what-are-some-problems-students-have-with-memory/

Alloway, T.P. (2009). Working memory, but not IQ, predicts subsequent learning in children with learning difficulties. *European Journal of Psychological Assessment, 25*(2), 92-98. doi: 10.1027/1015-5759.25.2.92

Wednesday Oct 17 (x-hour)*

Metacognition in Learning and Teaching

Metacognition, executive functions, and critical thinking.

Teaching Excellence in Adult Literacy. (2010). *TEAL Center fact sheet no. 4:*

metacognitive processes. Retrieved from https://lincs.ed.gov/sites/default/files/4_TEAL_Metacognitive.pdf

Pintrich, P.R. (2002). The role of metacognitive knowledge in learning, teaching, and assessing. *Theory Into Practice, 41*(4), 219-225. doi: 10.1207/s15430421tip4104_3

Fadel, C., Trilling, B., & Bialik, M. (2016, August). The role of metacognition in learning and achievement [Blog post]. Retrieved from https://ww2.kqed.org/mindshift/2016/08/10/the-role-of-metacognition-in-learning-and-achievement/

Bjorklund, D.F. (2005). Development of strategies and problem solving, In *Children's thinking: Cognitive development and individual differences, 5th Ed.* (pp. 265-295). Belmont, CA; Wadsworth.

*BRIEF ASSIGNMENT 2 DUE TODAY

Thursday Oct 18

Strategies for Strengthening Learning and Teaching: Part 1

Testing, retrieval, interleaving, note-taking, sleep, and feedback.

Rohrer, D. & Pashler, H. (2010). Recent research on human learning challenges conventional instructional strategies. *Educational Researcher, 39*(5), 406-412. doi:10.3102/0013189X10374770

McDaniel, M.A., Roediger, H.L., & McDermott, K.B. (2007). Generalized test-enhanced learning from the laboratory to the classroom. *Psychonomic Bulletin & Review, 14*(2), 200-206. doi: 10.3758/BF03194052

Karpicke, J.D. (2016, June). A powerful way to improve learning and memory [Blog post]. Retrieved from http://www.apa.org/science/about/psa/2016/06/learning-memory.aspx

Pan, S.C. (2015, 4 August). The interleaving effect: mixing it up boosts learning [Blog post]. Retrieved from https://www.scientificamerican.com/article/the-interleaving-effect-mixing-it-up-boosts-learning/

May, C. (2014). A learning secret: Don't take notes with a laptop. *Scientific American* (pp. 1-2). Retrieved from: http://scientificamerican.com/article/a-learning-secret-don-t-take-notes-with-a-laptop/

Tuesday Oct 23

Strategies for Strengthening Learning and Teaching: Part 2

Learning aptitudes, learning preferences, learning styles meshing hypothesis.

Willingham, D. (2009). How should I adjust my teaching for different types of learners. In *Why students don't like school* (pp. 113-130). San Francisco, CA: Josey-Bass.

Pashler, H., McDaniel, M., Rohrer, D., & Bjork, R. (2009). Learning styles: Concepts and evidence*. Psychological Science in the Public Interest, 9,* 105-119. doi: 10.1111/j.1539-6053.2009.01038.x

Kraemer, D., Rosenberg, L.M., & Thompson-Schill, S.L. (2009). The neural correlates of visual and verbal cognitive styles. *The Journal of Neuroscience, 29*(12), 3792-3798. doi: 10.1523/JNEUROSCI.4635-08.2009

Thursday Oct 25*

Assessing Learning and Teaching

Purposes of assessment; high-stakes testing, cut scores, and consequences; changes with the CCSS and ESSA; summative and formative assessment.

Ronan, A. (2015, April). Every teacher's guide to assessment [Blog post]. Retrieved from http://www.edudemic.com/summative-and-formative-assessments/

AERA Council. (2000, July). Position statement on high-stakes testing in pre-K-12 education [Blog post]. Retrieved from http://www.aera.net/About-AERA/AERA-Rules-Policies/Association-Policies/Position-Statement-on-High-Stakes-Testing/mid/16176/dnnprintmode/true?SkinSrc=%5bG%5dSkins%2f_default%2fNo+Skin&ContainerSrc=%5bG%5dContainers%2f_default%2fNo+Container

AERA Council. (2015, June). AERA statement on use of value-added models (VAM) for the evaluation of educators and educator preparation programs. *Educational Researcher, 44*(8), 448-452. doi:10.3102/0013189X15618385

Strauss, V. (2014, 29 August). State education board slams Obama administration's testing policies [Blog post]. Retrieved from https://www.washingtonpost.com/amphtml/news/answer-sheet/wp/2014/08/29/state-education-board-slams-obama-administrations-testing-policies/

Jochim, A., & McGuinn, P. (2016, Fall). The politics of the Common Core assessments. *Education Next, 16*(4), 44-52. Retrieved from http://educationnext.org/files/ednext_xvi_4_jochim_mcguinn.pdf

Darling-Hammond, L. (2014). Beyond the bubble test: why we need performance assessments [Blog post]. Retrieved from http://blogs.edweek.org/edweek/education_futures/2014/07/beyond_the_bubble_test_why_we_need_performance_assessments.html?print=1

*IN CLASS ACTIVITY TODAY

Tuesday Oct 30

Exam 2

Thursday Nov 1

Learning and Teaching Science

Scientific misconceptions; assimilation, accommodation, and conceptual change; constructivism; scientific literacy; NGSS.

AERA Council (2007). Science education that makes sense. *Research Points: Essential Information for Education Policy, 5*(1), 1-4.

Klahr, D. & Li, J. (2005). Cognitive research and elementary science instruction from the laboratory, to the classroom, and back. *Journal of Science Education and Technology, 41*(2), 217-238. doi: 10.1007/s10956-005-4423-5

Learning in the wild. (2010, 8 April). [Editorial]. Nature, 464, 813-814. doi: 10.1038/464813b

Tuesday Nov 6*

Learning and Teaching Math

Two systems for number; number sense; concepts, procedures, and facts; analyzing errors.

Griffin, S. (2004). Building number sense with Number Worlds: a mathematics program for young children. *Early Childhood Research Quarterly, 19*(1)*,* 173-180. doi:10.1016/j.ecresq.2004.01.012

Devlin, K. (2017, 1 January). Number sense: the most important mathematical concept in 21st Century K-12 education [Blog post]. Retrieved from http://www.huffingtonpost.com/entry/number-sense-the-most-important-mathematical-concept_us_58695887e4b068764965c2e0

Willingham, D.T. (2009/2010, Winter). Is it true that some people just can't do math? *American Educator,* 14-19, 39. Retrieved from https://www.aft.org/sites/default/files/periodicals/willingham.pdf

*IN CLASS ACTIVITY TODAY

Wednesday Nov 7 (x-hour)

Return Exam 2

Thursday Nov 8

Learning and Teaching Reading

Orthography, phonology, connectivity, semantics, whole language vs phonics.

Dehaene, S. (2009). Learning to read. In *Reading in the brain: The science and evolution of a human invention* (pp.196-210, 218-233). NY, NY: Viking.

Rayner, K., Foorman, B., Perfettti, C., Pesetsky, D., & Seidenberg, M. (2001). How psychological science informs the teaching of reading. *Psychological Science in the Public Interest, 2*(2), 31-68. doi: 10.1111/1529-1006.00004

Hindman, H.H., Wasik, B.A., & Snell, E.K. (2016). Closing the 30 million word gap: next steps in designing research to inform practice. *Child Development Perspectives, 10*(2), 134-139.

Koralek, D., & Collins, R. (1997, December). How most children learn to read. Retrieved from http://www.readingrockets.org/article/how-most-children-learn-read

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Tuesday Nov 13

Summary and Reflection*

Constructing a model of leaning, development, and teaching.

Alberts, B. (2011). Getting education right. *Science, 333,* 919. doi:10.1126/science.1212394

Stipek, D. (2011). Education is not a race. *Science, 332,* 1481. doi:10.1126/science.1209339

APA, Coalition for Psychology in Schools and Education. (2015). *Top 20 Principals from psychology for preK-12 teaching and learning.* Retrieved from http://www.apa.org/ed/schools/cpse/top-twenty-principals.pdf

Jones, S.M., & Kahn, J. (2017-2018, Winter). The evidence base for how learning happens: a consensus on social, emotional, and academic development. *American Educator*, *41*(4), 16-21, 42-43. Retrieved from https://www.aft.org/ae/winter2017-2018/jones_kahn

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*RESEARCH PARTICIPATION DUE

Monday Nov 19th 3:00 p.m.

Cumulative Final Exam