

**EDUCATION 01
THE LEARNING BRAIN:
INTRODUCTION TO CHILD DEVELOPEMENT AND EDUCATION**

FALL 2014

General Information

Professor: Michele Tine
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Phone: 603-646-9043
Office: Raven House 211
Office Hours: W 11:15 a.m.-2:15 p.m.

Class Time: (10A) Tu, Th 10:00 a.m.-11:50 a.m.
X-hour: W 3:00-3:50 p.m.
Class Meeting Location: TBA

Course Description

Education, development, and learning are inextricably intertwined. We will explore how the science of learning and development connects with education from preschool to high school. Survey topics include school structure, teaching, assessment, motivation, memory, higher-level thinking, math, reading, writing, science, and social and emotional development. For each topic, we will consider research from multiple perspectives, including neuroscience, developmental psychology, and education, in order to build a complex, interdisciplinary understanding of the typically developing learning brain.

Course Goals

- Introduce the developing field of Mind, Brain, and Education (MBE) that serves as the focus of the Education Department. This approach is the wave of the future in education and Dartmouth is on the cutting edge of this movement.
- Introduce you to the research and courses offered in the Education Department that use the MBE approach.
- Understand and critically evaluate foundational findings of developmental psychology (M) and neuroscience (B). Integrate how these foundational findings impact and are impacted by education (E).
- Improve your ability to write about scientific findings and express yourself in a logical, clear, and concise manner.

Required Readings

There is no textbook for this class. The readings for this course are scientific articles or excerpts. The scientific articles and excerpts have been posted to the course Canvas site in two places. To access the readings that are followed by the notation '(LR)' on the syllabus, click the 'Library Reserves/Guides' link on the Canvas main menu. To access the readings that are followed by the notation '(CA)', click the 'Course Articles' link on the course Canvas site.

Description of Course Requirements

1. Class Participation and Attendance

Participation is an important component of this course and will be based on class attendance and participation in class discussions. It is expected that the required readings will have been completed before you come to class and you are prepared to comment, question, discuss, and/or critique them.

2. Participation in a Research Study

The goal of this assignment is to provide you with an insightful perspective on research studies. Please complete one of the following options by **Thur Nov 13th**.

Option #1: Volunteer to participate in a research study in the Education Department

Volunteer to participate in a research study conducted by any research lab in the Education Department. Specific instructions on how to sign up for research studies are posted on Canvas. To get credit, you must hand in a signed *EDUC01 Participant Confirmation Form* to me in class anytime before **Thur Nov 13th**. A copy of the form is posted on Canvas.

Option #2: Write a hypothetical study experience overview

If you are unable to participate or uninterested in participating in a research study, you may write a hypothetical study experience overview. First, locate an empirical article that has college student participants. Second, in approximately one page, write a bulleted list that summarizes what you would experience if you were a participant in the study. Third, in approximately five sentences, explain one experiential aspect of the study that you think the researchers could improve upon without sacrificing the scientific integrity of the study. Hand in your overview to me in class anytime before **Thur Nov 13th**. Attach a copy of the first page of the empirical article, including the abstract.

3. Brief Assignments

There will be three brief assignments due throughout the term.

Brief Assignment #1:

Reading, Understanding, and Critically Analyzing Empirical Research Articles.

The purpose of this assignment is to help you feel comfortable reading and evaluating the various components of an empirical research article. First, you will need to locate the empirical article entitled "What Does Doodling Do?" written by Jackie Andrade and published in the journal *Applied Cognitive Psychology*. Then, you will need to answer a set of questions about the specific components of the article (e.g., abstract, introduction, methods, results, discussion). More specific instructions are posted on Canvas. **Due Sept 30th**.

Brief Assignment #2:

Neuroscience and Education in the News.

This assignment is designed with two primary goals in mind. The first is to critically evaluate scientific and education reports in the media. The second is to explore the connections between brain research and education. The assignment has 3 parts. 1) Find and summarize a news article reporting on a brain related finding or an education finding. 2) Assess the claims made in the news article by finding the original scientific article or results and determine the accuracy of the media report. 3) Integrate and interpret this report in terms of the links between brain research and education. Detailed instructions are on Canvas. Your paper should only be 1.5 pages double-spaced, so make sure every word counts. **Due Oct 23rd**.

Brief Assignment #3:

Constructing Valid Assessment Answers

Student assessment is a hot topic in the field education for many reasons. This assignment aims to spur some in class discussion about assessment in general, provide you with insight as to how difficult it can be to construct valid assessment items, and provide you with a study tool. There are two parts to this assignment. 1) You will each be assigned one reading from class. Write one multiple-choice question about the content of the reading. The question should be appropriate for a college-level midterm exam. In half of a page, justify the “correct” answer and explain the inaccuracies of the “incorrect” answers. 2) Write one short-answer question about the content of the reading. Write 2-3 sentences that constitute an ideal answer.

Depending on your article assignment, you will be placed into ‘Group A’ or ‘Group B’. The deadlines for the two groups are different. Group A: **Due Oct 15th**. Group B: **Due Nov 11th**.

You will be graded on the quality of your questions, the accuracy of your answers, and the appropriate level of difficulty for college-level exams. Detailed instructions are posted on Canvas. Please note: I will pull a handful of your questions and include them on the final exam.

4. Midterm Exams

There will be two midterm exams given in class. The first will be on **Oct 9th**. The first midterm will include content covered up to and including the class period before the exam. The second midterm will be on **Nov 4th** and will cover content covered only after the first midterm. Both midterms will include a variety of assessment formats including multiple choice, short answer, and short essay and both will be based on the required readings, lectures, and in-class discussions.

5. Final Exam

There will be a final exam on **MONDAY, Nov 24th at 11:30 a.m.** The final will be cumulative. Like the midterms, the final will include a variety of assessment formats including multiple choice, short answer, and short essay and will be based on the required readings, lectures, and in-class discussions.

Course Requirements and Grading

Participation and Attendance: 4%
Participation in a Research Study: 2%
Brief Assignment #1: 6%
Brief Assignment #2: 6%
Brief Assignment #3: 6%
Midterm #1: 22%
Midterm #2: 22%
Final: 32%

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 of any assignment turned in one day late and an **additional five percent** will be deducted for each additional day that passes.

You are responsible for the assignments even if you cannot be in class on the day they are due. If you cannot be in class, please turn in the assignment to me **before** class time and it will not be counted as late.

RWIT: The Student Center for Research, Writing, and Information Technology

RWIT is a free service dedicated to helping students develop more effective strategies for generating and organizing ideas, finding and evaluating research sources, and revising compositions. At RWIT, you can meet one-on-one with a tutor to discuss a paper, research project, or assignment. Whether you are brainstorming, drafting, or polishing, the tutors can provide feedback that will help improve your work. This is a wonderful service that you are lucky to have as a Dartmouth student. Take advantage of it. To make an appointment, please see <http://www.dartmouth.edu/~rwit/students/appointment.html>

Students with Disabilities

Students with disabilities enrolled in this course and who may need disability-related classroom accommodations are encouraged to see me privately as early as possible in the term. Students requiring disability-related accommodations should register with the Student Accessibility Service office. Once SAS has authorized accommodations, students should show the originally signed SAS Accommodations/Consent Form and/or a letter on SAS letterhead to me. As a first step, if students have questions about whether they qualify to receive accommodations, they should contact the SAS office. All inquiries and discussions about accommodations will remain confidential. If you have any questions, please do not hesitate to ask.

Academic Honor Principle

You are expected to familiarize yourself with and uphold all aspects of the Academic Honor Principle. See the ORC Bulletin or <http://www.dartmouth.edu/~uja/honor> for the official statement. You may not receive or provide assistance on any quiz or exam. All work must be your own and submitted only for this class. Plagiarism is the submission or presentation of work, in any form, that is not your own, without acknowledgment of the source. You must cite all sources according to the formal APA guidelines. I take the Academic Honor Principle seriously and expect you to do the same.

Religious Observances

Some students 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 before the end of the second week of the term to discuss appropriate accommodations.

Detailed Class Schedule of Topics and Readings

Note: Readings are to be *completed* by the indicated date. The schedule is subject to change.

FOUNDATIONS

Tu Sep 16 **Welcome, Overview, and Introduction**

FOUNDATIONS OF EDUCATION

Th Sep 18 **Overview of US Educational System: School Structure**

US Department of Education (2008). *USA education in brief* (pp. 1-28). Retrieved from <http://www.america.gov/publications/books/education-in-brief.html> (CA)

Mervis, J. (2011). Past successes shape effort to explain early intervention. *Science*, 333, 952-956. (LR)

Optional: US Department of Education (2003). No child left behind: A parents guide (pp. 1-31). Retrieved from <http://www2.ed.gov/parents/academic/involve/nclbguide/parentsguide.pdf> (CA)

Tu Sep 23 **Schooling: Does It Work?**

Cahan, S., & Cohen, N. (1989). Age versus schooling effects on intelligence development. *Child Development*, 60, 1239-1249. (LR)

Loveless, T. (2011). How well are American students learning? *Brown Center on Educational Policy at Brookings*, 2(5), 13-20. (CA)

Manwaring, R. (2010). Restructuring 'restructuring': Improving interventions for low-performing schools and districts. *Education Sector Reports*, 1-20. (CA)

Mervis, J. (2011). Giving children a head start is possible- but it's not easy. *Science*, 333, 956-957. (LR)

FOUNDATIONS OF NEUROSCIENCE

Th Sep 25 **Brain Development**

Society for Neuroscience (2011). Brain facts: A primer on the brain and nervous system (pp. 1-22). Retrieved from <http://www.sfn.org/index.aspx?pagename=brainfacts> (CA)

Blakemore, S., & Frith, U. (2005). *The learning brain* (pp. 188-195). Malden, MA: Blackwell Publishing. (CA)

Shaw, P., et al. (2006). Intellectual ability and cortical development in children and adolescents. *Nature*, 440(30), 676-679. (LR)

Holloway, M. (2003). The mutable brain. *Scientific American*, 289(3), 78-85. (CA)

FOUNDATIONS OF MIND, BRAIN, & EDUCATION (MBE)

Tu Sept 30 Neuromyths

Slavin, R. (2008). Perspectives on evidence-based research in education- what works? Issues in synthesizing educational program evaluations. *Educational Researcher*, 37, 5-14. (LR)

US Department of Education (2003). Identifying and implementing educational practices supported by rigorous evidence: A user friendly guide (pp. 2-21). Retrieved from <http://www.america.gov/publications> (CA)

Geake, J. (2008). Neuromythologies in education. *Educational Research*, 50(2), 123-133. (LR)

DUE: BRIEF ASSIGNMENT #1

Th Oct 2 Research Methods and the Research-Practice Gap

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. (CA)

Coch, D., & Ansari, D. (2009). Thinking about mechanisms is crucial to connecting neuroscience and education. *Cortex*, 45, 546-547. (LR)

Dubinsky, J.M. (2010). Neuroscience education for prekindergarten-12 teachers. *Journal of Neuroscience*, 30(24), 8057-8060. (LR)

MULTIDISCIPLINARY APPROACH

CLASSROOM COGNITION

Tu Oct 7 Memory

Ormrod, J.E. (2009). Basic components of memory. In *Human learning* (pp. 166-186). Upper Saddle River, NJ: Allyn & Bacon. (CA)

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. (LR)

Morrison, A.B., & Chein, J.M. (2011). Does working memory training work? The promise and challenges of enhancing cognition by training working memory. *Psychonomic Bulletin Review*, 18, 46-60. (LR)

Th Oct 9 MIDTERM #1

Tu Oct 14

Motivation

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. (LR)

Deci, E.L., Vallerand, R.J., Pelletier, L.G., Ryan, R.M. (1991). Motivation in education: The self-determination perspective. *Educational Psychology*, 26, 325-346. (CA)

Dweck, C.S. (2007). Secret to raising smart kids. *Scientific American Mind*, 18, 36-43. (LR)

Stipek, D. (2011). Education is not a race. *Science*, 332(24), 1481. (LR)

**W Oct 15
X-HOUR**

Higher Level Thinking and Learning: Strategy and Problem Solving

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. (CA)

Britz, J. (1993). Problem solving in early childhood classrooms. *ERIC Digest*, 1-5. (CA)

NIMH Press Release (2004). Imaging study shows brain maturing. Retrieved from <http://www.nimh.nih.gov/science-news/2004/imaging-study-shows-brain-maturing.shtml> (CA)

DUE: BRIEF ASSIGNMENT #3 (GROUP A ONLY)

Th Oct 16

NO CLASS TODAY. PROFESSOR TINE AT RESEARCH CONFERENCE

CLASSROOM INSTRUCTION

Tu Oct 21

Differentiated Learners/Learning Styles

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. (CA)

Pashler, H., McDaniel, M., Rohrer, D., & Bjork, R. (2009). Learning styles: Concepts and evidence. *Psychological Science in the Public Interest*, 9, 105-119. (LR)

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. (LR)

Th Oct 23

Effectiveness of Different Teaching Methods

Rohrer, D. & Pashler, H. (2010). Recent research on human learning challenges conventional instructional strategies. *Educational Researcher*, 39(5), 406-412. (LR)

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

Kang, S., McDaniel, M., Pashler, H. (2011). Effects of testing on learning of functions. *Psychonomic Bulletin & Review*, 18, 998-1005. (CA)

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/>

DUE: BRIEF ASSIGNMENT #2

CLASSROOM CONTENT

Tu Oct 28

Math

NAEP (2008). *Trends in academic progress: Mathematics 1973-2008* (pp. 28-46). Washington DC: National Center for Education Statistics. (CA)

Santrock, J.W. (2009). Learning and cognition in content areas: Mathematics. In *Educational psychology* (pp. 398-403). NY, NY: McGraw Hill. (CA)

Dehaene, S., Spelke, E., Pinel, P., Stanescu, R., & Tsivkin, S. (1999). Sources of mathematical thinking: Behavioral and brain-imaging evidence. *Science*, 284(5416), 970-974. (LR)

Ansari, D. (2008). Effects of development and enculturation on number representation in the brain. *Nature*, 9, 278-291. (LR)

Th Oct 30

Science

Santrock, J.W. (2009). Learning and cognition in content areas: Science. In *Educational Psychology* (pg 404-406). NY, NY: McGraw Hill (CA)

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

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. (LR)

Tu Nov 4

MIDTERM #2

Th Nov 6

Reading

Santrock, J.W. (2009). Learning and cognition in content areas: Reading. In *Educational psychology* (pp. 381-390). NY, NY: McGraw Hill. (CA)

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. (CA)

Wolf, M. (2007). When should a young child begin to read? In *Proust and the squid: The story and science of the reading brain* (pp. 94-96). NY, NY: Harper Collins. (CA)

Rayner, K., Foorman, B., Perfetti, C., Pesetsky, D., & Seidenberg, M. (2001). How psychological science informs the teaching of reading. *Psychological Science in the Public Interest*, 2(2), 31-68. (LR)

CLASSROOM EXPERIENCE: EMOTIONAL AND SOCIAL PROCESSES

Tue Nov 11 Emotional Processes in Learning

Pekrun, R., Goetz, T., Titz, W., & Perry, R. (2002). Academic emotions in students' self-regulated learning and achievement; a program of qualitative and quantitative research. *Educational Psychologist*, 37(2), 91-105. (LR)

Van Geert, P. & Steenbeek, H. (2008). Brains and the dynamics of 'wants' and 'cans' in learning. *Mind, Brain, and Education*, 2(2), 62-66. (LR)

Dalgleish, T. (2004). Timeline: The emotional brain. *Nature Reviews Neuroscience*, 5(7), 582-589. (LR)

DUE: BRIEF ASSIGNMENT #3 (GROUP B ONLY)

Th Nov 13 Social Processes in Learning

Blakemore, S.J. (2010). The developing social brain: Implications for education. *Neuron*, 65, 744-747. (LR)

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. (LR)

Decety, J., Jackson, P., Sommerville, J., Chaminade, T., & Meltzoff, A. (2004). The neural bases of cooperation and competition: an fMRI investigation. *Neuroimage*, 23, 744-751. (LR)

DUE: PARTICIPATION IN A RESEARCH STUDY OPTION #1 OR #2

CONCLUSIONS

REFLECTIONS & MOVING THE FIELD FORWARD

Tu Nov 18 Sylvan, L.J. & Christodoulou, J.A. (2010). Understanding the role of neuroscience in brain based products: A guide for educators and consumers. *Mind, Brain, Education*, 4(1), 1-7. (LR)

Coch, D. Michlovitz, S.A., Ansari, D. & Baird, A. (2009). Building mind, brain, and education connections: The view from the Upper Valley. *Mind, Brain, and Education*, 3(1), 27-33. (LR)

Hinton, C., & Fisher, K.W. (2008). Research schools: Grounding research in educational practice. *Mind, Brain, and Education*, 2(4), 157-160. (LR)

M Nov 24 FINAL EXAM at 11:30 a.m.

References

- AERA (2007). Science education that makes sense. *Research Points: Essential Information for Education Policy*, 5(1), 1-4.
- 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.
- Ansari, D. (2008). Effects of development and enculturation on number representation in the Brain. *Nature*, 9, 278-291.
- Berk, L. (2006). How well educated are North American young people? In *Child development* (pp. 636-638). Boston, MA: Pearson Education.
- 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.
- Blakemore, S., & Frith, U. (2005). *The learning brain* (pp. 188-195). Malden, MA: Blackwell Publishing.
- Blakemore, S.J. (2010). The developing social brain: Implications for education. *Neuron*, 65, 744-747.
- Britz, J. (1993). Problem solving in early childhood classrooms. *ERIC Digest*, 1-5.
- 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.
- Cahan, S., & Cohen, N. (1989). Age versus schooling effects on intelligence development. *Child Development*, 60, 1239-1249.
- Coch, D., & Ansari, D. (2009). Thinking about mechanisms is crucial to connecting neuroscience and education. *Cortex*, 45, 546-547.
- Coch, D. Michlovitz, S.A., Ansari, D., & Baird, A. (2009). Building mind, brain, and education connections: The view from the Upper Valley. *Mind, Brain, and Education*, 3(1), 27-33.
- Dalgleish, T. (2004). Timeline: The emotional brain. *Nature Reviews Neuroscience*, 5(7), 582-589.
- Decety, J., Jackson, P., Sommerville, J., Chaminade, T., & Meltzoff, A. (2004). The neural bases of cooperation and competition: An fMRI investigation. *Neuroimage*, 23, 744-751.
- Deci, E.L., Vallerand, R.J., Pelletier, L.G., Ryan, R.M. (1991). Motivation in education: The self-determination perspective. *Educational Psychology*, 26, 325-346.
- 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.
- Dehaene, S., Spelke, E., Pinel, P., Stanescu, R., & Tsivkin, S. (1999). Sources of mathematical thinking: Behavioral and brain-imaging evidence. *Science*, 284(5416), 970-974.
- Dubinsky, J.M. (2010). Neuroscience education for prekindergarten-12 teachers. *Journal of Neuroscience*, 30(24), 8057-8060.
- Dweck, C.S. (2007). Secret to raising smart kids. *Scientific American Mind*, 18, 36-43.
- Hinton, C., & Fisher, K.W. (2008). Research schools: Grounding research in educational practice. *Mind, Brain, and Education*, 2(4), 157-160.
- Holloway, M. (2003). The mutable brain. *Scientific American*, 289(3), 78-95.
- 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.
- Geake, J. (2008). Neuromythologies in education. *Educational Research*, 50(2), 123-133.
- Kang, S., McDaniel, M., Pashler, H. (2011). Effects of testing on learning of functions. *Psychonomic Bulletin & Review*, 18, 998-1005.
- 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.
- 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.
- Loveless, T. (2011). How well are American students learning? *Brown Center on Educational Policy at Brookings*, 2(5), 13-20.
- Manwaring, R. (2010). Restructuring 'restructuring': Improving interventions for low-performing schools and districts. *Education Sector Reports*, 1-20.
- 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/>
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- Mervis, J. (2011). Giving children a head start is possible- but it's not easy. *Science*, 333, 956-957.
- 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.
- Morrison, A.B., & Chein, J.M. (2011). Does working memory training work? The promise and challenges of enhancing cognition by training working memory. *Psychonomic Bulletin Review*, 18, 46-60.
- NAEP (2008). *Trends in academic progress: Mathematics 1973-2008* (pp. 28-36). Washington DC: National Center for Education Statistics.
- NIMH Press Release (2004). Imaging study shows brain maturing. Retrieved from <http://www.nimh.nih.gov/science-news/2004/imaging-study-shows-brain-maturing.shtml>
- Optional: US Department of Education (2003). No child left behind: A parents guide (pp. 1-31). Retrieved from <http://www2.ed.gov/parents/academic/involve/nclbguide/parentsguide.pdf>
- Ormrod, J.E. (2009). Basic components of memory. In *Human learning* (pp. 166-186). Upper Saddle River, NJ: Allyn & Bacon.
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- Pekrun, R., Goetz, T., Titz, W., & Perry, R. (2002). Academic emotions in students' self-regulated learning and achievement; a program of qualitative and quantitative research. *Educational Psychologist*, 37(2), 91-105.
- Rayner, K., Foorman, B., Perfetti, C., Pesetsky, D., & Seidenberg, M. (2001). How psychological science informs the teaching of reading. *Psychological Science in the Public Interest*, 2(2), 31-68.
- Rohrer, D. & Pashler, H. (2010). Recent research on human learning challenges conventional instructional strategies. *Educational Researcher*, 39(5), 406-412.
- Santrock, J.W. (2009). Learning and cognition in content areas: Reading. In *Educational psychology* (pp. 381-390). NY, NY: McGraw Hill
- Santrock, J.W. (2009). Learning and cognition in content areas: Mathematics. In *Educational psychology* (pp. 398-403). NY, NY: McGraw Hill.
- Santrock, J.W. (2009). Learning and cognition in content areas: Science. In *Educational Psychology* (pp. 404-406). NY, NY: McGraw Hill
- Shaw, P., et al. (2006). Intellectual ability and cortical development in children and adolescents. *Nature*, 440(30), 676-679.
- Slavin, R. (2008). Perspectives on evidence-based research in education- what works? Issues in synthesizing educational program evaluations. *Educational Researcher*, 37, 5-14.

- Snowman, J., & Biehler, R. (2006). Approaches to instruction. In: *Psychology applied to learning* (pp. 354-358: Direct Instruction, 362-365: Constructivism; 378-383: Cooperative Learning). Boston, MA: Houghton Mifflin.
- Society for Neuroscience (2011). Brain facts: A primer on the brain and nervous system (pp. 1-22). Retrieved from <http://www.sfn.org/index.aspx?pagename=brainfacts>
- Stipek, D. (2011). Education is not a race. *Science*, 332(24), 1481.
- Sylvan, L.J. & Christodoulou, J.A. (2010). Understanding the role of neuroscience in brain based products: A guide for educators and consumers. *Mind, Brain, Education*, 4(1), 1-7.
- US Department of Education (2008). *USA education in brief* (pp. 1-28). Retrieved from <http://www.america.gov/publications/books/education-in-brief.html>.
- US Department of Education (2003). *Identifying and implementing educational practices supported by rigorous evidence: A user friendly guide* (pp. 2-21). Retrieved from <http://www.america.gov/publications>
- Van Geert, P. & Steenbeek, H. (2008). Brains and the dynamics of 'wants' and 'cans' in learning. *Mind, Brain, and Education*, 2(2), 62-66.
- 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.