

**EDUCATION 01
THE LEARNING BRAIN:
INTRODUCTION TO CHILD DEVELOPMENT AND EDUCATION
SPRING 2017**

General Information

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| Professor: Michele Tine | Class Time: (10A) Tu, Th 10:10 a.m.-12:00 p.m. |
| Email: michele.tine@dartmouth.edu | X-hour: W 3:30-4:20 p.m. |
| Phone: 603-646-9043 | Location: Life Sciences Center 100 |
| Office: Raven House 211 | |
| Office Hours: Tuesday 12:30 p.m. - 2:30 p.m. and by appointment | |

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

- 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.

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 Readings' link on the Canvas page. To access the readings that are followed by the notation '(CA)', click the actual '(CA)' icon listed after the reading citation on the Daily Schedule on the course Canvas site. (CA stands for Course Articles, in case you're curious.)

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.

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 completed *EDUC01 Participant Confirmation Form* to me in class anytime before the due date. 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 the due date. 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. They are due at the start of class.

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.

Brief Assignment #2:

Neuroscience and Education in the News.

This assignment is designed with two primary goals: to critically evaluate scientific and education reports in the media and to explore the connections between neuroscience and education research. The assignment has 3 parts. 1) Find and summarize a news article reporting on a neuroscience or an education finding. 2) Find the original scientific article and then assess the accuracy of the claims made in the news article. 3) Discuss the links between neuroscience research and education. Detailed instructions are on Canvas. Your paper should be 1.5 pages double-spaced, so make sure every word counts.

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.

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 midterm will include content covered up to and including the class period before the exam. The second midterm 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 also be a final exam and 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 required readings, lectures, and in-class discussions.

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| Course Requirements and Grading |
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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 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 (205 Collis Student Center, 646-9900, 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.

Academic Honor Principle

I take the Academic Honor Principle seriously and expect you to do the same. You are expected to familiarize yourself with and uphold all aspects of the Academic Honor Principle. You can find it stated at <http://www.dartmouth.edu/judicialaffairs/honor/index.html>. 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.

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 March 28 Welcome, Overview, and Introduction

FOUNDATIONS OF EDUCATION

Th March 30 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)

Winter, G. (2003, January 21). Schools resegregate, study finds. *The New York Times*.

Tu April 4 Education Policy: Efforts

Miller, T. & Hanna, R. (2014). Four years later, are race to the top states on track? *Center for American Progress*, 1-12. Retrieved from <https://www.americanprogress.org/issues/education/report/2014/03/24/86197/four-years-later-are-race-to-the-top-states-on-track/>

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)

Editorial Projects in Education Research Center. (2016, March 31). Issues A-Z: The Every Student Succeeds Act: An ESSA Overview. *Education Week*. Retrieved Month Day, Year from <http://www.edweek.org/ew/issues/every-student-succeeds-act/> (CA)

Th April 6 Education Policy: Effectiveness

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

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

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

FOUNDATIONS OF NEUROSCIENCE

Tu April 11 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)

DUE: BRIEF ASSIGNMENT #1

FOUNDATIONS OF MIND, BRAIN, & EDUCATION (MBE)

Th April 13 Neuromyths and Research-Practice Gap

Kamenetz, A. (2017, March 22). You probably believe some learning myths: take our quiz and find out. Retrieved from <http://www.npr.org/sections/ed/2017/03/22/520843457/you-probably-believe-some-learning-myths-take-our-quiz-to-find-out>

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

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)

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

MULTIDISCIPLINARY APPROACH

CLASSROOM COGNITION

Tu April 18 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 April 20 NO CLASS TODAY. PROFESSOR TINE AT RESEARCH CONFERENCE.

Tu Apr 25 MIDTERM #1

W April 26 **Higher Level Thinking and Learning: Strategy and Problem Solving**
X-HOUR 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)

Th April 27 **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)

CLASSROOM INSTRUCTION

Tu May 2 **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 May 4

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 May 9

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 May 11

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 May 16

MIDTERM #2

Th May 18

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

Tu May 22

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

Th May 25

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)

Tu May 30 Reflections and Moving the Field Forward

Sylvan, L.J. & Christodoulou, J.A. (2010). Understanding the role of neuroscience in brain based products: A guide for educators and consumers. *Mind, Brain, and 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)

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

M June 2 FINAL EXAM at 3:00 p.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.
- Editorial Projects in Education Research Center. (2016, March 31). Issues A-Z: The Every Student Succeeds Act: An ESSA Overview. *Education Week*. Retrieved Month Day, Year from <http://www.edweek.org/ew/issues/every-student-succeeds-act/> (CA)
- 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.
- Kamenetz, A. (2017, March 22). You probably believe some learning myths: take our quiz and find out. Retrieved from <http://www.npr.org/sections/ed/2017/03/22/520843457/you-probably-believe-some-learning-myths-take-our-quiz-to-find-out>
- 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/>
- 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.
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- Miller, T. & Hanna, R. (2014). Four years later, are race to the top states on track? *Center for American Progress*, 1-12. Retrieved from <https://www.americanprogress.org/issues/education/report/2014/03/24/86197/four-years-later-are-race-to-the-top-states-on-track/>
- 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.
- Pashler, H., McDaniel, M., Rohrer, D., & Bjork, R. (2009). Learning styles: Concepts and evidence. *Psychological Science in the Public Interest*, 9, 105-119.
- 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.
- Reardon, S. F. (2013). The widening income achievement gap: New evidence and possible Explanations. In R. J. Murnane & G. J. Duncan (Eds.), *Whither Opportunity? Rising Inequality, Schools, and Children's Life Chances*, New York: Russell Sage Foundation.
- 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>.
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