

Educational Neuroscience
EDP 369K (10427) & EDP 382 (10543)
Spring 2015
SZB 240, Monday 9:00-12:00

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Course Description

This course is designed to provide a basic foundation in educational neuroscience (aka Mind, Brain, and Education Science). This course will explore the interactions between neurobiological processes and education, examining how cognitive neuroscience can inform and guide educational practice as well as how the impact of the educational experience on brain development and brain functioning can increase our understanding of functional neural systems. We will begin with an introduction to the field of educational neuroscience and a review of various “neuromyths.” This will be followed by a review of brain anatomy, brain development, and brain imaging that will form the foundation for our subsequent exploration of the neuroscientific aspects of specific cognitive, behavioral, and learning domains. The course will conclude by reviewing current applications of educational neuroscience in the classroom and future directions of the field.

Course Objectives

This course should help students:

- Develop the fundamental vocabulary of educational neuroscience
- Identify “neuromyths”
- Develop a critical view of the literature and claims related to the brain and teaching techniques
- Critically evaluate ideas and research studies
- Accurately distinguish proven information from unproven information in educational neuroscience
- Improve practice by appropriately applying educational neuroscience concepts
- Improve their ability to develop and evaluate learning strategies using educational neuroscience principles, tenets, and instructional guidelines

Format

This class will be conducted in an interactive manner and will require a great deal of student participation. We learn more efficiently when we are forced to think critically instead of simply repeating memorized lists of concepts without reflection. Respectful disagreement often is a good way to improve thinking skills. This course will offer many opportunities for discussion and debate. You are encouraged to take divergent approaches to the material in the course, to challenge findings, and simply to disagree.

Required Readings

Readings for this course will be drawn primarily from the following books:

- Davis, A.S. (Ed.). (2011). *The Handbook of Pediatric Neuropsychology*.
- Geake, J.G. (2009). *The Brain at School: Educational Neuroscience in the Classroom*.
- Sousa, D.A. (Ed.). (2010). *Mind, Brain, and Education: Neuroscience Implications for the Classroom*.
- Tokuhamu-Espinosa, T. (2010). *The New Science of Teaching and Learning: Using the Best of Mind, Brain, and Education Science in the Classroom*.
- Zillmer, E.A., Spiers, M.V., & Culbertson, W.C. (2008). *Principles of Neuropsychology*.

Additional articles and chapters may be added as we progress through the course. All readings will be made available to you on Canvas.

Activities and Expectations

1. Professionalism, Punctuality, and Participation

Professionalism. Professionalism includes such things as establishing and maintaining positive relationships and interactions with peers, colleagues, and instructors, attending respectfully to others who are sharing information with the class, being flexible and understanding in response to unforeseen changes in the class syllabus, etc. Examples of behaviors likely to result in a loss of professionalism points might include: sleeping in class, doing work that is unrelated to the course in class, talking excessively to your neighbor during lectures or when a classmate is asking a question, and making negative or derogatory comments about others. Please ensure that cell phones are turned off prior to entering the classroom, as phone calls during class are generally disruptive to the instructional activities of the class. The use of laptop computers in class is restricted to taking notes or other class-related uses only.

Punctuality. Attendance and punctuality are key components of overall professionalism. Despite the challenges of traffic and the juggling of personal and professional schedules, it is an expectation for this course that students will attend every class meeting and will arrive to class on time. Attendance in this class is particularly critical to mastering the course objectives. If an absence is expected, students should inform the professor in advance.

Participation. Students are expected to fully participate in all class activities, including lectures, discussions, and any collaborative learning activities. Student participation and discussion is a critical element of the course. Students will be expected to come to class well prepared to engage in scholarly discourse about the day's scheduled subject matter.

2. Discussion Leadership

To facilitate participation and student interaction, students will be assigned as Co-Discussion Leaders for a single class session. These individuals will present an overview of the topic and required readings, including Powerpoint presentation. These students will also be asked to assign supplementary reading material pertinent to their topic (e.g., a current research article).

3. Paper

To further motivate the development of expertise in the topic for which you are a Discussion Leader, you will also write a paper on an aspect of educational neuroscience that is relevant to your assigned discussion topic. Details on the requirements for this paper will be provided later in the semester. Papers will be due at the end of the semester.

4. Discussion Worksheets

Discussion worksheets are a way of learning to read with awareness, such that you consciously evaluate both what you are reading and your understanding of it, as a prelude to in-class discussion of the reading in which you will work with your peers to help each other understand the reading in greater depth and with more critical awareness. Discussion worksheets should be completed for each *supplemental reading assignment* prior to the class session for which the reading was assigned. In class, we will discuss the readings. Students will use their discussion worksheets as aids. Worksheets are to be turned in at the end of each class in which the readings are discussed.

5. Examination

In order to ensure a complete understanding of the course materials, a comprehensive final examination will be administered at the end of the course.

This examination will consist of objective and short essay questions from information in the readings, lectures, and discussions.

6. Feedback

I am always interested in improving my courses, and one of the best ways to improve a course is to listen and respond to criticism from students. Therefore, feedback is always welcome. Please do not be shy about letting me know how my teaching strategies are either helping or hindering your learning. I understand that direct feedback may be difficult for some, so you will have the opportunity for anonymous feedback as well.

Grading

Punctuality, Participation, & Professionalism	20%
Discussion Leadership	20%
Paper	20%
Discussion Worksheets.....	20%
Final Exam.....	20%

93 – 100%	A	77 – 79%	C+
90 – 92%	A-	73 – 76%	C
87 – 89%	B+	70 – 72%	C-
83 – 86%	B	60 – 69%	D
80 – 82%	B-	Below 60%	F

Course Schedule

(This schedule represents current plans. As we go through the semester, these plans may change. Any such changes will be communicated clearly.)

Date	Class Topic	Readings
1/26	Course Overview	---
2/2	Introduction to Educational Neuroscience & "Neuromyths"	Geake, Ch. 1; Tokuhamma-Espinosa, Ch.5
2/9	Neuroanatomy & Neurophysiology	Zillmer, Ch. 5
2/16	Neurodevelopment	Davis, Ch. 2-5
2/23	Neuroimaging	Sousa, Ch. 2
3/2	Intelligence	Geake, Ch. 4
3/9	Learning & Memory	Geake, Ch. 3
3/16	SPRING BREAK	
3/23	Attention & Executive Functions	TBA
3/30	Social & Emotional Behavior	Geake, Ch. 6; Sousa, Ch. 4
4/6	Language & Literacy	Geake, Ch. 7
4/13	Math	Geake, Ch. 8
4/20	Art, Creativity, & Music	Geake, Ch. 5 & 9
4/27	Exercise, Nutrition, & Sleep	TBA
5/4	Applications of Educational Neuroscience	Sousa, Ch. 3; Tokuhamma-Espinosa, Ch.8