

BRAIN-COMPATIBLE TEACHING AND LEARNING
Mark-making and the Construction of Knowledge
THE MULTILITERATE MIND

Only one thing is certain - that written language of children develops in this fashion, shifting from drawings of things to drawings of words. The entire secret of teaching written language is to prepare and organize this natural transition appropriately...Make believe play, drawing and writing can be viewed as different moments in an essentially unified program of development of written language.

—Lev Vygotsky, “The Prehistory of Writing,” an essay, c. 1930 in *The Mind in Society*, 1978.

“Drawing/Writing and the New Literacy (embodies) insight on science education....demonstrating the value of hands-on,kinesthetic participation by the student of whatever age (and I’m one of them) in addressing the real world. Find out what others know - of course - but then repeat it with your eyes and hands, then add your own observations, and then, finally, own the subject. That’s a good prescription for education generally.”

E.O. Wilson, Harvard University, January 8, 1998, correspondence.

EDUC

3 Credits

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COURSE DESCRIPTION:

This course introduces practical principles from neurobiology for designing brain compatible educational practice. A handful of existing curricula emphasize student skills, knowledge and response, train students in a range of sign systems, and deliberately encourage translations across sign systems. This course explores these curricula as the wave of the future when media literacy and information literacy are essential skills. Hands-on experience with a brain-based literacy strategy is provided. The culminating experience requires the participants' design of a brain-based teaching and learning strategy appropriate for their classroom. The course is supported by readings including the instructor's text *Drawing/Writing and the new literacy*, Sheridan, 1997.

The course introduces the educational theory Neuroconstructivism and its literacy practice *Drawing/Writing*. Neuroconstructivism proposes that children construct not only knowledge but mind on neural levels. How the brain learns in childhood persists over a lifetime of learning. The brain can change, but attitudes and habits acquired in childhood affect adult modes of thinking,including self-image, feelings about drawing and reading and writing and mathematics, and approaches to thinking in general.

Neuroconstructivist theory includes the Scribble Hypothesis, or the neurobiology of scribbling, the Peek-a-boo principle of responsive interaction, the brain-based principle of cross-modality including translations between systems of representations, and the rationale for a literacy education based on multiple literacies. The course includes thirteen principles of brain-based education as well as a curriculum guide for brain-compatible teaching and learning across content areas.

The specific practice, *Drawing/Writing*, models the general abilities of the brain's two hemispheres -- spatial and visual abilities, and linguistic and verbal abilities -- while connecting them via exchanges or translations. *Drawing/Writing* opens its program with what children do instinctively to develop their visual and verbal intelligence: they scribble and draw. By practicing what the human brain does naturally -- mark-making as well as translations between mark-making systems -- students strengthen visual skills, verbal skills, and translational skills. These three sets of skills comprise the major operations in human thinking.

GENERAL INSTRUCTIONAL GOALS OF THE COURSE FOR THE TEACHER:

The goal of the course is to provide a compelling rationale and hands-on experience for brain compatible teaching and learning in general, and for a brain-based literacy education in particular through information, discussion, direct experience, and the design and presentation of a teaching and learning strategy.

Course participants will gain the following through class readings and discussion:

- 1) knowledge that speech, play, drawing and writing constitute a developmental continuum, and that, by preserving the connections between these activities, children are less likely to have problems with attention, speech, reading, writing,

and self-directed learning.

- 2) knowledge that child-centered constructivist approaches to education emphasize children's responses and existing knowledge and skills, with an understanding that this kind of approach to education logically places the child's earliest marks including scribbling and drawing at the beginning of the literacy continuum.
- 3) knowledge that human exchanges as well as brain processes are antiphonal, or call-and-response in nature, and why responsive interaction informs not only effective parenting but effective educational theory and practice.
- 4) familiarity with 13 principles of brain-compatible teaching and learning distilled from research in the fields which comprise cognitive science including psychology, linguistics, regular and special education, and neurobiology located in Part Three of the course text book.

Course participants will gain the following from hands-on experience with the Neuroconstructivist strategy, Drawing/Writing:

- 1) direct experience with drawing as a universal skill which can be used to train students in attention, self-directed learning, and self-esteem, without which any educational program is a hollow shell.
- 2) direct experience with drawing as a substantive cognitive activity, as well as the beginning of literacy.
- 3) direct experience with how drawing can be used with writing in cross-modal or transmediational exercises, encouraging the brain to make translations across sign systems, practicing the human brain's consummate skill: multiple literacies.
- 4) direct experience with how ethical discussions can be organized around discussions about compositions in drawing.
- 5) direct experience with how the teaching of grammar can be embedded in children's drawing and writing.
- 6) direct experience with a dynamic language learning environment in which students and teachers are equally engaged in exchanges and transformations.

EMOTIONAL, SOCIAL AND EDUCATIONAL INSTRUCTIONAL GOALS FOR TEACHERS AND STUDENTS IN A NEUROCONSTRUCTIVIST CLASSROOM

As a model for Neuroconstructivist methodologies, the Drawing/Writing system integrates student-response, practice with decoding images and text, or reading; practice with encoding information visually and verbally, or drawing and writing; speaking skills via peer sharing, peer mentoring, group critiques; and reading and writing aides including a group-constructed vocabulary, practice with constructive criticism, practice with scientific inquiry, and portfolio self-assessment. Thus, the overall instructional goals of this course for students and for teachers are:

- 1) increased self-reliance as a thinker
- 2) more accurate and compelling speaking, reading and writing skills in connection with visual and verbal material across a range of sign systems including images and text
- 3) more effective social and communication skills
- 4) better trained critical and creative thinking skills
- 5) habits of self-reflection
- 6) an interest in self-assessment as a visual and verbal thinker
- 7) a curious, lively, open, engaged, cooperative, kindly and compassionate mind.

Overview:

More than multiple intelligences, many of which we share with creatures, multiple literacies distinguish human intelligence. We're mark-makers. Drawing is our distinguishing language instinct, and scribbling is where it all begins. Drawing, writing, mathematical notation, musical notation are methods for inquiry, providing alternative ways to know and to express information and emotion. Two or more methods allow the human brain do what it does best: make comparisons between systems of representation. Because the new translation, or information, or output is different than, or *other* than, the input, cross-modal brain procedures are non-linear, or dynamic. The D/W five step deliberately models interhemispheric processes.

The visual and verbal skills developed by a comprehensive cross-modal literacy program are described as multiple literacy. These skills will include drawing, writing, arithmetic, mathematical notation, and musical notation. This particular course focuses on two of these literacies: drawing and writing. This course shows how both skills are embedded in each other, and emergent from each other, rather than separate and sequential. In a Neuroconstructivist elementary school program, all four literacies would be introduced as embedded, emergent systems. Such a program welcomes and encourages the multiliterate child. The human brain has evolved to be multiliterate. Technology requires multiple media literacies as well as transmediation skills. Nursery school and kindergarten are the places to begin cross-modal teaching and learning, starting with children's natural skills, including drawing.

It is this course's position that drawing - even more than speech - is our fundamental human language instinct. It is empirically true that children like to draw. Drawing is instinctual for children. Practically speaking, it makes sense to use drawing in a language arts program. Twenty years of field research by the instructor support Neuroconstructivist theory and Drawing/Writing. The brain is a complex unity. Effective teaching will reflect this complex unity.

Course Topics:

1) Brain information useful to brain compatible teaching and learning

- plasticity
- windows of opportunity
- synesthesia
- hemispheric asymmetry
- multistage integration in the visual brain
- redundancy, and self-remediation
- music and the brain
- the emotional brain
- guided visualization
- accelerated learning
- brain gym exercises

2) Additional psychological/sociological/educational information useful to brain compatible educational theory and practice:

- fetal alcohol syndrome
- brain damage due to emotional and physical abuse, including maternal drug abuse other than alcohol: neurotoxins
- attention deficits
- hyperactivity,
- dyslexia and dysgraphia,
- depression
- stress
- sleep disorders including those in children who watch television before bedtime.
- obesity in children
- fatigue and human error
- suicide
- emotions and disease
- aides and injury to memory
- brain-imaging and new understandings on childhood, adolescence, and aging
- smart drugs

3) A range of educational theories and practices which meet brain-based guidelines:

- constructivism
- reader response theory
- writing workshop
- reading workshop
- literature circles
- National Art Basics (Iowa State College)
- multiple intelligences
- transmediation
- intertextualizing across sign systems

4) Hands-on practice with the cross-modal multiple literacy strategy Drawing/Writing:

5) A closing paper showing understanding of brain-based theory and classroom practice.

Measurable Outcomes:

Students' familiarity with and understanding of the global and specific goals of the course will be observable through peer exchanges, class discussion of readings, D/W portfolios, reader response journals, D/W journal including new concepts and new vocabulary, practice with additional transmediational exchanges across sign systems, and the writing and presentation of a final project/paper.

Project/Paper - at least two pages

Page one in essay form should include:

A definition in the student's own words of Neuroconstructivist theory and cross-modal practice.

A general description of the new cross-modal activity

The rationale for this cross-modal activity

The benefits and the measurable outcomes of the cross-modal strategy.

Page two can include the following in a bulleted list:

The materials required for the activity

The steps in the cross-modal activity

Methods for self-evaluation and self-reflection

Grading.

(email to SRSheridan later) description of actual outcomes after putting your strategy into practice .

Grading:

Students will self-evaluate their portfolios and journals using a check list.

50%

Students will self-evaluate for peer interactions, group discussions and critiques on a scale of 1-10

10%

Attendance: % hours attended over total hours of classroom time = x % of 10

10%

2-page paper outlining a cross-modal teaching and learning strategy due last day of class

30%

Abstract for "The Scribble Hypothesis" and "The theory of Multiple Literacies" are available on the Drawing/Writing website (www.drawingwriting.com).

DAY ONE: Morning discussion, educational and neurobiological theory and practice.

Afternoon, Thumbnail sketch, Neuroconstructivism. Dr/Wr and bilateral brain development. Start of hands-on work with D/W: Preliminary Drawing and Writing. The Blind Contour and Regular Contour Drawings. Every step begins and ends with discussion of the intent and results of each Dr/Wr step. The vocabulary journal. Reading assigned: Part One of

Drawing/Writing and the new literacy. Other handouts. Repeat the day's Dr/Wr at home. Start work on own cross-modal strategy.

DAY TWO: Morning discussion, educational and neurobiological theory and practice.
Afternoon, continuing with the steps of D/W: Basic Shape DR/WR (Euclidean, organic and fractal) Geometry discussion. Peer sharing, group critique, vocabulary building. Read Part Two of Text, plus hand outs. Repeat the day's Dr/Wr at home. Work on own cross-modal strategy.

DAY THREE: Morning discussion, educational and neurobiological theory and practice.
Afternoon, continue with D/W: Light-Medium-Dark Dr/Wr. Peersharing, group critique, vocabulary building. The Perfect Whole DR/WR. Peersharing, group critique, vocabulary building. Read Part Three, "Hitchhikers' Guide." Hand outs. Repeat the day's Dr/Wr at home. Work on own cross-modal strategy.

DAY FOUR : Morning discussion, educational and neurobiological theory and practice.
Afternoon, continue work with D/W: The Composite Abstraction, #1 and #2. Peersharing, group critique, vocabulary building. Closing Drawing and Writing. Self Evaluation with Rescore. Read Part Four, "Thinking Child," plus hand outs. Work on own cross-modal strategy. Paper due on day five.

DAY FIVE: Morning wrap-up discussions, group construction ideal educational and neurobiological theories and practices.
Afternoon, Peer-pair presentation new cross-modal teaching and learning strategy. Self- assessment. Determination of grades by students, verified by students, and recorded by instructor. Slides of student work with D/W from the past 20 years.

BIOGRAPHICAL INFORMATION, INSTRUCTOR:

Dr. Sheridan is an artist, writer, parent and teacher. She received her undergraduate degree in Classics and English from Harvard College and her MAT and her doctorate in education from the University of Massachusetts in Amherst. Dr. Sheridan has taught English and Art at the middle school, high school and college levels for the past twenty years, most recently through Westfield State College. Drawing/Writing courses are offered through Fitchburg State College, Westfield State College, UMASS, Amherst, Holyoke Community College, Merrimac Education Center in Chelmsford, MA, and through the Worcester Art Museum. This spring Dr. Sheridan will present Dr/Writing at Eastern Ct. State University, and at Lesley College in Boston. See the Dr/Wr web site below for details.

Dr. Sheridan's theory of education Neuroconstructivism, and her cross-modal practice Drawing/Writing are the result of twenty years of teaching and field research. Currently, Dr. Sheridan is working on a home-based multiple literacy program for parents. For more information, visit the Drawing/Writing website:

www.drawingwriting.com
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Required reading:

Drawing/Writing and the new literacy, Susan Rich Sheridan, 1997.
Order directly 413-549-1606, or via ssheridan@drawingwriting.com or via amazon.com or any bookstore.

Other useful readings:

Acredolo, Linda & Goodwyn, Susan
1996 *Baby Signs: How to Talk with Your Baby Before Your Baby Can Talk*. Chicago: Contemporary Books.
Ashton-Warner, Sylvia
1963 *Teacher*. New York: Simon and Schuster.
Cadwell, Louise Boyd
1997 *Bringing Reggio Emilia Home: An Innovative Approach to Early Childhood Education*. New York: Teachers College Press.

- Caine, R. & Caine, G.
1991, 1994 *Making Connections: Teaching and the Human Brain*. New York: Addison-Wesley Publishing Group
- Caine, R. & Caine, G.
1997 *Education on the Edge of Possibility*. Alexandria, VA: ASCA.
- Calkins, L.
1997 *Raising Lifelong Learners: a parent's guide*. Cambridge, MA: Perseus Books.
- Campbell, Don
1997 *The Mozart Effect: Tapping the Power of Music to Heal the Body, Strengthen the Mind, and Unlock the Creative Spirit*. New York: Avon Books.
- Condon, William S.
1975 "Multiple Response to Sound in Dysfunctional Children," *Journal of Autism and Childhood Schizophrenia*, Vol. 5 No. 1, 37-55.
1978 "Asynchrony and Communicational Disorders," Autism Research Symposium, 2nd annual conference, University of British Columbia, Vancouver, May.
1979 "Neonatal entrainment and enculturation," *Before Speech: the beginning of interpersonal communication*, M. Bullova, ed., 132-148. Cambridge University Press.
1981 "Sound-Film Microanalysis: A means for correlating Brain and Behavior," ICDR Symposium, Phila, May 22, 1-34.
1982 "Cultural Microrhythms." *Interaction Rhythms: Periodicity in Communicative Behavior*, Martha David, ed., 53-101. New York: Human Services Press.
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1994 *Cognition and curriculum reconsidered*. New York: Teachers College Press.
- Elbow, Peter
2000 *Everyone can Write: Essays toward a hopeful theory of writing and teaching writing*. London: Oxford University Press.
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1993 *First Drawings: Genesis of Visual Thinking*. Pleasant Valley, CA: Exelrod Press.
- Goleman, Daniel
1994 *Emotional Intelligence: Why it can matter more than IQ*. New York: Bantam Books.
- Gopnik, Alison with Patricia Kuhl and Andrew Meltzoff
1999 *The Scientist in the Crib*. New York: Morrow.
- Jensen, E.
1997 *Brain Compatible Strategies*. San Diego, CA: The Brain Store.
- Kabat- Zinn, Myla & Jon
1997 *Everyday Blessings: The Inner Work of Mindful Parenting*. New York: Hyperion Press.
- Kagan, Jerome
1998 *Three Seductive Ideas*. New York: Oxford University Press.
- Olson, Janet L.
1992 *Envisioning Writing: toward an integration of drawing and writing*. Portsmouth, NH: Heinemann.
- Papert, Seymour
1980 *Mind Storms*. New York: Basic Books.
- Perkins, David
1981 *The Mind's Best Work*. Cambridge, MA: Harvard University Press.
- Rosenblatt, L.
1978. *The reader, the text, the poem*. Carbondale, IL: Southern University Press.
- Schiffer, F.
1998 *Of Two Minds: the Revolutionary Science of Dual -Brain Psychology*. New York: The Free Press.
- Sheridan, S.
2001 The Neurological Significance of Children's Drawings: Scribble Hypothesis, International Visual Literacy Association Journal, 2001.
1999 "Arts-based education in a technological society," *Focus*, PAGES Westfield State College
1997 *Drawing/Writing and the new literacy*. Amherst, MA: Drawing/Writing Publications.
1992 "The Thinking Child: More like the World. An Holistic Model Combining Education and Economics," an award-winning proposal accepted by the America 2000 National Competition.
1991-2 "Neurobiological Guidelines for Education," National Forum of Teacher Education Journal, vol. 1, 12-20.
1990-1991 "Drawing/Writing: Effects of a Brain Research-Based Writing Program on Children's Thinking Skills," National Forum of Teacher Education Journal, vol. 7, number 3, 87-100.

- 1991 "Drawing/Writing and the Native American Middle School Student: Multi-Cultural Applications of a Brain Research-Based Writing Program," presented at New England Educational Research Conference, Portsmouth, NH.
- 1990 "Drawing/Writing: Scope of a Brain Research-Based Writing Program. Developing Thinking Skills in an Age of Cognitive Pluralism. Generalizing Special Education," presented at Orton Society National Conference, Washington, D.C.
- 1990 "Drawing/Writing: a brain-based writing program designed to develop descriptive, analytical and inferential thinking skills at the elementary level. UMASS dissertation, microfiche: in ERIC, available electronically and on microfiche.
- 1990 "The Bill Budge Pin-Ball Machine and Douglas MacLeod: a study of the effect of an educational computer game on a child's intuitive thinking about Newtonian laws " 1990, Unpublished paper.
- Short, L., & Kauffman, G.
2000 Exploring sign systems within an inquiry curriculum. In M. Gallego & S. Hollingsworth (Eds.), *Challenging a single standard*. New York: Teachers College Press.
- Striker, S.
2001 *Young at Art: Teaching Toddlers Self-Expression, Problem-solving Skills, and an Appreciation for Art*. New York: Henry Holt and Co.
- Trelease, Jim
1982 *The Read Aloud Handbook*. New York: Penguin Books.
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1934 *Thought and Language*. Cambridge, Mass: MIT Press.
1978 *Mind In Society: The Development of Higher Psychological Processes*. Michael Cole, Vera John -Steiuuner, Sylvis Scribner, Ellen Souberman, eds. Cambridge, MA: Harvard University Press.
- Zeki, Semir.
1999 *Inner Vision: An Exploration of Art and the Brain*. Oxford Univ. Press, Oxford, England.