Thinking about Thinking: Processes of Metacognition
Fall 2016 (9-7-16)

Graduate Program in Critical and Creative Thinking

Course: CrCrTh655   **3 credits**

Instructor: David S. Martin, Ph.D.; davidmartindr@aol.com

## I.	Description

The primary goal of education is to stretch the mind, to increase each person's ability to keep on learning on one's own. This goal requires that educators understand theories of the nature and development of human abilities. They need to adopt a conceptual framework that explains the development of the important tools of learning and thinking and recognizes the propensity of all humans to acquire such tools. It also requires that teachers acquire a technology for the application of such theory in the classroom, integrate these practices in the school curriculum, and assess their effectiveness.

This course will make use of the Feuerstein/Vygotsky theoretical model of Mediated Learning (Feuerstein's elaborate cognitive map and his empirically supported program, known as Feuerstein's Instrumental Enrichment or FIE) to learn important principles of metacognition(thinking about thinking) as an essential mental tool for becoming an effective problem-solver. Included in the course are techniques and principles relating to: self-awareness, reflection, strategic planning, mental mapping, and inner dialogue.

Texts:

Feuerstein, R. et al.(2006). The Feuerstein Instrumental Enrichment Program. Glencoe (IL): International Renewal Institute, Inc. Order using attached order form(Avoid ordering through Amazon—they are far more expensive there than with the publisher). ISBN 965-7389-00-0. $60 plus shipping and tax.

Other required readings will be distributed in a packet, and on-line as well.

## II.	Objectives

During the course students will:

A. Become acquainted with theories of human cognitive development.

B. Become familiar with research on human cognitive development.

C. Be able to plan for classroom use of samples of the teaching materials of a cognitive-strategies program, which will include student strategies for acquiring and applying the strategies of: organization, orientation, comparison, analysis, synthesis, creating precise instructions, time relationships, hierarchies, and logic.

D. Be able to apply the transfer mechanism.

E. Be able to identify, analyze, and evaluate cognitive processes.

F. Be able to analyze tasks according to the cognitive processes they require, according to the Cognitive Map and how it relates to metacognition.

G. Demonstrate the verbal behaviors needed to encourage students' metacognitive behavior.

H. Become aware of one's own mental processes and how that awareness can lead to becoming a more effective problem-solver.

I. Construct and peer-teach model lessons which foster metacognition.

J. Use a working knowledge of the rationale for metacognition, its manifestations, and strategies for promoting it with learners.

III. Content Outline

A. The theory of Structural Cognitive Modifiability and survey of the research on human cognitive modifiability and metacognition.

Three characteristics of human structural cognitive modifiability will be discussed from both theoretical (Gestalt and constructivist) research and applied points of view. Those include:

     Permanence   - endurance across time and space

     Persuasiveness   - part affects whole and vice-versa

     Centrality   - self-perpetuating, self-regulating

B. Cognitive Developmental and Learning Models

Socio-cultural theories (Vygotsky, Feuerstein) will be compared with the Piagetian model and the behavioral models of cognitive development. The implications for classroom teaching and metacognition will be discussed.

C. The Multidimensional and Multifaceted Nature of Cognition

Various classification models of intellective abilities will be reviewed. The discussion will include the theoretical, empirical, and applied aspects of these models.

D. Cognitive Functions (emphasis will include functions at the input, elaboration, and output phases).

Cognitive functions concerning the quality and quantity of data gathered by an individual in an attempt to solve problems that will be analyzed. These include: perceptual problems, impulsivity, impaired spatial and temporal orientation, lack of need for precision, deficient organization, and more.

E.Analysis and Hands-on Experience with samples of the cognitive tools used in a cognitive-strategies program, including the purpose of metacognition.

F.Discuss how the Theory of Mind fits with metacognitive awareness

G. Develop and practice techniques of metacognition and analyze its place in the problem-solving process.

IV. Evaluation

This course is an intensive, practical graduate course for professional development.

The following standards apply to all assignments and participation in this course:

Participation in classroom discussions and exercises should demonstrate the acquisition of the course content.

The required papers (see Assignments) should demonstrate a high level of integration and reflection, including mechanical accuracy.

V. Assignments

Students will be responsible for the following assignments:

1. Prepare a lesson plan which utilizes one of the instruments explained in this course, including topic, objective, activities, materials, adaptations for special-needs learners, and assessment techniques; teach the lesson to the rest of the class; after feedback, include the lesson as part of a professional portfolio. The lesson will include techniques of inducing metacognitive behavior in students, and will be presented to the group on <u>Monday,</u> <u>October</u> <u>24</u>.

2. Read, summarize, critique, and present to the rest of the class a review of one of the books or three of the articles listed in the bibliography. Present the summary orally on <u>Monday</u>, <u>November 14</u>, with written outline to the instructor.

3. Complete an Observation Report of a classroom in action of your choice, describing the kinds of metacognitive activities and questions that the teacher organizes and their outcomes as you see them. Use the Observation Guidelines at the end of the syllabus.
     Prepare to summarize your observations and submit the Report on <u>Monday, December 5</u> or before.

4. Write one long paper (10 pages double-spaced, plus references) on the theoretical rationale for metacognitive activities, followed by plans for how to integrate 5 different cognitive activities in relation to the subject matter for which you are responsible in the classroom where you teach (math, language, social studies, science, or other subject) , together with at least two metacognitive questions that you would ask students for each of the 5 activities. <u>Due Monday, Dec.12.</u> <u>NOTE: This assignment may be included in the Reflective Practitioner's</u> <u>Portfolio (http://cctrpp.wikispaces.umb.edu).</u>

Required Readings (to be distributed electronically)

Metacognition and Cognitive Monitoring (Flavell)
Fact Sheet: Metacognitive Processes
What is Metacognition? (Martinez)
Metacognition
Metacognition (Wikipedia excerpt)
Metacognition (3 basic elements)
Metacognition—Thinking about Thinking (a skills list)
Metacognition: Strategies for Four Thought(Hanson)—to be sent electronically
Who Needs Metacognition More: Students or Teachers ? (Kozulin)
Excerpts from Feuerstein and Rand, Instrumental Enrichment, 2006 – purchase, using order form

Bibliography (Select from non-asterisked items for required article/book review):

Brown, A. (1978). Knowing when, where, and how to remember: A problem of metacognition. In R. Glaser (Ed.), Advances in Instructional Psychology. Hillsdale, NJ: Erlbaum.

Brown, A. (1987). Metacognition, executive control, self-control, and other mysterious mechanisms. In F.Weinert and R. Kluwe(Eds.), Metacognition, Motivation, and Understanding , pp. 65-116. Hillsdale, NJ: Erlbaum.

Bull, S. & Kay, J. (2008). Metacognition and open learner models. 9th International Conference on Intelligent Tutoring Systems, Montreal, Canada.

*Costa, A. (2001). Mediating the metacognitive. In Developing Minds, 3rd edition, A. Costa (Ed.). Alexandria, VA: Association for Supervision and Curriculum Development.

Duell, O.K. (1986). Metacognitive skills. In G.Phye &T. Andre (Eds.), Cognitive Classroom Learning, Orlando, FL: Academic Press.

Dulofsky, J.D. and Metcalfe, J. (2009). Metacognition. Los Angeles: Sage.

Flavell, J. (1979). Metacognition and cognitive monitoring: A new area of cognitive-developmental inquiry. American Psychologist, 34 (10), 906-911.

*Flavell, J. (1976). Metacognitive aspects of problem-solving. In L.B. Resnick (Ed.), The nature of intelligence, pp. 231-236. Hllsdale, NJ: Erlbaum.

Forrest-Pressley, D., MacKinon, G., &Walter. T. (1985). Metacognition, cognition, and human performance. Orlando: Academic Press.

Garner, R. (1987). Metacognition and Reading Comprehension. Norwood, NJ: Ablex.

Hartman, H. (2001). Metacognition in Learning and Instruction: Theory, Research, and Practice. Dordrecht: Kluwer Academic Publishers.

*Kozulin, A. (2005). <u>Who needs metacognition more: Students or teachers?</u> Paper presented at the Annual Meeting of the American Educational Research Association, April 2005, Montreal, Canada.

*Martinez, M. (2006). What is metacognition? <u>Phi Delta Kappan</u>, May 2006, 696-699.

Roll, I. & Aleven, V. (2008). Measuring metacognition and self-regulated learning in educational technologies. 9<u>th</u> <u>International conference on Intelligent Tutoring Systems</u>, Montreal, Canada.

Shimamura, A. (2000). Toward a cognitive neuroscience of metacognition. <u>Consciousness and</u> <u>Cognition, 9</u>, 313-323.

*=to be discussed in class sessions

<u>School Cancellations.</u> In the event of a school cancellation, we will resume class as usual on the next scheduled class day. Changes to the class schedule will be discussed during the first class meeting following the cancelled class.

<u>Code of Conduct.</u> The University's Student Code of Conduct (http://www.umb.edu/life_on_campus/policies/code) exists to maintain and protect an environment conducive to learning. It sets clear standards of respect for members of the University community and their property, as well as laying out the procedures for addressing unacceptable conduct. Students can expect faculty members and the Office of the Dean of Students to look after the welfare of the University community and, at the same time, to take an educational approach in which students violating the Code might learn from their mistakes and understand how their behavior affects others. It is your own responsibility to understand and abide by UMass's Student Code of Conduct, which includes the university's academic honesty policy. Please note that failing to observe this policy can result in severe penalties ranging from a 0 on an assignment, to failing the course, to being expelled from the university.

<u>Accommodations</u> .Sections 504 and the Americans with Disabilities Act of 1990 offer guidelines for curriculum modifications and adaptations for students with documented disabilities. If applicable, students may obtain adaptation recommendations from the Ross Center (287-7430). The student must present these recommendations to each professor within a reasonable period, preferably by the end of the Drop/Add period. Consult with the Ross Center for assistance.

<u>Overview of Grading</u>.	<u>Grading Process</u>
Class participation: 25%	A: 95-100 points
Lesson Plan: 15%	A-: 90-94
Articles/Book Critique: 20%	B+: 86-89
Observation Report: 15%	B: 83-85
Final Paper: 25%	B-: 80-83

Course Schedule:

September 12

Session 1—Overview of the need for critical thinking and cognitive development

      Review of the theories of cognitive development, with emphasis

        on Piaget, Vygotsky, and Bruner; key concepts of metacognition

      Distribution of materials; a cognitive and metacognitive activity

September 19

Session 2—The theory and characteristics of mediated learned experience; the

        purposes and techniques of metacognition in the classroom

      The history of cognitive mediation in cultural contexts

      Strategy 1—projecting virtual relationships and being organized

      READ: Milestones in the "Thinking Movement"(emailed)

        Metacognition (description of a skill)

        Flavell, Metacognition and Cogntive Monitoring

        Fact Sheet: Metacognitive Processes

September 26—no class

Oct. 3

Session 3-- Criteria for selection of a thinking-strategies program

      A Memory activity

      The Cognitive Map--phases of cognitive functions(emailed)

      READ: What is Metacognition? (Martinez)

        Metacognition (Thinking about Thinking)

        Feuerstein (Theory of Mediated Learning)

        Feuerstein, Chapters 1 and 2, and pp. 185-196

Oct. 10

Session 4—Planning a cognitive-education learning episode

      Integration of cognitive strategies into the regular

        subject matter of the curriculum; the place of metacognition

        in an instructional sequence for problem-solving

      Comparison as a universal cognitive strategy and theme

      A Guide for Academic Writing (emailed)

      A Memory activity revisited

Oct. 10 (cntd.)

        READ: Metacognition (Wikipedia excerpt)

             Metacognition (3 basic elements)

             Feuerstein, pp. 242-250

Oct. 17

Session 5—Analysis of a cognitive-learning episode

        READ: Metacognition—Knowing How to Learn

             Metacognition: Strategies for Four Thought (Hanson)

Oct. 24

Session 6—Metacognition and its place in the Executive Functions List

        Developing and sharing model lesson plans

        Learning and the Brain Conference Summary (emailed)

        Magic and the Brain

        DUE: Lesson Plan

Oct. 31

Session 7-- Categorization and its pre-requisites; metacognition

        and its place in categorization processes

        Applications to all subject matter of the curriculum

        Three types of Metacognition

        READ: Feuerstein, pp. 251-257

             Developing Minds excerpts (Ed., Costa)

Nov. 7

Session 8-- Review of strategies used thus far

        Applications of research to studies on metacognition

        READ: Who Needs Metacognition More?, Kozulin (emailed)

             The Ladder of Metacognition

             Stages of Metacognition

 Nov. 14

Session 9—The application of Logic—a higher-order cognitive strategy

        Share reports on articles and books

        READ: Feuerstein, 248-256

        DUE: Oral Summary of separate book or 3 articles reviewed, with

        written report to instructor

Nov. 21

Session 10—The Theory of Mind—expansion of applications

      World-wide research studies on cognitive mediation and

        Metacognition

      Theory of Lawrence Kohlberg on stages of emotional development

      Empathy and metacognition

      READ: Handouts on Theory of Mind, on website to be given

Nov. 28

Session 11—The role of teacher education; how teaching

      changes as a result of cognitive education

      Evaluating student progress in the acquisition

      of cognitive strategies and the promote of students'

      metacognition

      A summary activity for metacognition: Synthesis

      How metacognition enhances success in group cognition

      READ: Feuerstein, pp. 454-456; 297-304

        Think Out Loud (excerpts from Wilson and Conyers)

Dec. 5

Session 12—Summary of cognitive education and the place of metacognition

      Observation of students' metacognitive behavior, using criteria

      below; report on observations

      DUE: Observation Report

Dec. 12

Session 13 Summation of classroom actions to be taken as next

      steps in the implementation of consist metacognitive

      activities in the classroom

      Sharing term paper contents

      Course evaluation—use the link http://bit.ly/CCTEval

      DUE: Final Paper

GUIDELINES FOR OBSERVING METACOGNITIVE BEHAVIOR

Verbalizes the Problem

Discusses how to solve the Problem

Identifies what needs to be Known

Develops a plan of Action

Recognizes when the plan needs to Modified

Evaluates the success of the Strategies used

Reflects on the Processes used

Identifies new Contexts for application of similar processes

Due: December 5, 2016

<u>GUIDELINES FOR LESSON PLAN</u>

Purpose:

Expected Outcomes:

Materials and Media to be used;

Procedural Steps:

Accommodations for students with Special Needs:

Assessment Procedures:

Follow-up Steps:
Due: October 24, 2016

GUIDELINES FOR ARTICLES/BOOK CRITIQUE

Statement of Author(s) qualifications

Summary of articles/book key ideas

Critique of articles/book ideas and applications

Closing Commentary

Due: November 14, 2016

GUIDELINES FOR TERM PAPER

Title Page

Table of Contents

Introduction

Literature Review

Methods of application of metacognition to one specific subject matter (math,
   language, social studies, science, the arts, etc.)

Frequency of application of metacognitive activities and assessment techniques

Three sample lesson plans, one of which may be a revised version of the Lesson
   Plan submitted earlier

Factors in implementing metacognition: how to promote its importance to
   School administrators, required teacher professional development,
   Follow-up ideas for working with teachers

Conclusion, including future directions for promoting the place of metacognition

References

Appendices

(Remember to check for mechanical accuracy: spelling, punctuation, grammar)

DUE: December 12, 2016