

Conceptual Change and Learning

CrCrTh652

Spring 2015

Monday, 4:00-6:45 PM

Wheatley 2-157

Contact Information

Instructor: Orin C. Davis, Ph.D.

Office Hours: Monday in person, otherwise virtual, by appointment only

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Textbooks:

- 1) *R&W: Rosebery, A. & Warren, B. (2008) Teaching Science to English Language Learners: Building on students' strengths. National Science Teachers Association, NSTA Press* (NTSA is hosting a free ebook version [[link](#)])
- 2) Other readings as assigned (see [course wiki](#))

Course Description

This course explores the ways children and adults think about their natural and social world and how that affects their learning. It is particularly concerned with identifying and describing the organized conceptual frameworks children have prior to instruction (which typically are different from the scientists' or researchers' conceptualizations) and with understanding the general processes by which conceptual frameworks can be changed. One important question concerns the ways in which children are fundamentally different learners and thinkers from adults and the ways in which they are fundamentally similar.

Course Overview

How do we organize our little corner of the universe? How do we make sense of the new information that we encounter, and then integrate it into our lives? We learn and discover on a daily basis, and process an impressive amount of information. In this course, we will examine the organizational systems of the mind and analyze how they are developed and changed, and consider how this process occurs in both personal life and a diverse array of fields.

Course Objectives

- Become familiar and conversant with the terminology surrounding concept development and learning
- Learn to develop your own conceptual frameworks and facilitate others' development of same
- Apply the principles of conceptualization and learning to a variety of fields
- Develop your own skill at first-hand inquiry: making observations, representing observations, finding patterns of data, creating models to explain the data, using models to make new predictions, revising models in light of further data, etc.

Communication

I will post course materials and announcements on the wiki (<http://crcrth652.wikispaces.umb.edu/>). You are required to check the wiki regularly (at least 2 times per week). *You are responsible for being cognizant of all course announcements.*

Please remember that you are responsible for attending class in the format in which you signed up (online or face-to-face), and that online students should be familiar with how to attend class punctually and with limited technological glitches.

(Suggestions: <http://caps-courses.umb.edu/courses/spring/cr/gr/crcrth/>)

School Cancellations

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.

Code of Conduct

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.

Accommodations

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.

Course Requirements and Grading

Class participation. This is a course rooted in thoughtful discussion and consideration of the material. Ergo, it is incumbent upon you to be prepared *at all times*. Class participation is a major part of the course, and will require that you be active and engaged at each meeting, in addition to occasionally leading class discussions. You will be graded as a function of the depth, thoughtfulness, and activity of your participation. In order to do this, you need to be attentive, and to make substantive statements that go beyond merely [dis]agreeing and/or providing an example of your own experience. You need to explain your line of reasoning and show why the example is relevant. At minimum, constructive commentary requires analysis of the sources to defend a contention. Better is insightful performance that leads the listener to new insights and ideas through complex arguments that are rooted in the interplay and analysis of multiple sources. Often this requires a thesis, a discussion of the caveats to the thesis, and a resolution (synthesis) that indicates when the thesis does and does not apply. A good guideline is to make sure you have spoken substantively at least 2-3 times per class.

Private Universes Presentation. 5-10 minute presentation on how to teach science (see Week 8).

Ethnographic Study: How do people operate? *As we go through this course, you will analyze your own concept development process through an ethnographic study of a group of people (your choice). Each week, you will use the class material and the practicum lessons to create and hone your understanding of how a particular group of people tends to operate. Based on what you learn, you will go out into the world and make specific observations pursuant to the material discussed that week. Among the challenges of this assignment that will be developed in the course are: defining/categorizing the group of people (criteria for inclusion, operating definitions), finding a systematic way to observe, integrating the observations into a clear and coherent picture, understanding the limitations of the process and using that understanding to correct the process.* This will lead to three different assignments:

1-2) ***Reflection Journal and Lab Notebook.*** Each week, write up your notes (~2 pages) and a 1-2 page (single-space, 12-point, Times New Roman) paper that reflects upon what you learned that week. Submit your notebook and journal at the end of the semester. You are strongly advised to do peer review of laboratory notebooks. ***DUE 5/15 AT 12 PM EASTERN.***

3) ***Final Project.*** The final will require you to organize your notes and journal and to write a clear, coherent explanation of your conception of how the group of people works. You should show your observation, conceptualization, and ideation processes while making liberal references to how the course material underpinned your processes. In addition, discuss how your conceptions changed over the course of the project, and what contributed to those changes – how have *you* changed while taking this class and (most especially) while doing this project? Conduct additional outside research that confirms or refutes your contentions (at least 5 academic [e.g., journal articles, monographs] sources total, over and above the course material). Note that you *do not* need to have a correct answer or conception – what you need is a clear, concise, and coherent method that fits with what you have learned. Present everything in a well-written paper (spelling, grammar, and good writing all count as part of your grade). As a guideline, the paper should be about 10-12 pages double-spaced, 12-point, Times New Roman font (20 pages max, and this is nearly impossible to do in less than 8). You will give a 10-minute presentation on your work during the last week of class. This assignment is suitable for inclusion in the [Reflective Practitioner's Portfolio](#). ***PAPER IS DUE 5/15 AT 12 PM EASTERN.***

Overview of the Grading

Class participation:	25%
Private Universes Presentation:	5%
Reflection journal and notebook:	35% (20% journal, 15% notebook)
Final project:	35% (25% paper, 10% presentation)

How to Succeed in This Course

I would like very much for all of you to be successful in this course and to enjoy the learning experience. To that end, these are my recommendations for doing well in my course:

- Read the chapter before attending lecture. Lectures are prepared with the assumption that you have read the material assigned for that day. That is, *you are seeing this material for the second time.*
- Do not leave any assignment until the last minute. Reflections should be written throughout the semester, and likewise for the lab notebook. Expect the final paper to take at least **20** hours to develop, write, and edit – start early!
- Email me if you have questions, but try to solve the issue yourself, first. When you email me, I will want to know how you have attempted to answer the question so that I may guide you more effectively. Remember, *try to solve it yourself*, and then email me if you cannot do so.
- Remember the following adage: prepare for at least twice as long as the schedule hours of the course. Since there are 3 hours of class per week in this course, you should devote about 6 additional hours per week to preparing for this course. That's less than an hour a day!
- Bring your passion! This is a very exciting subject, and I encourage you to dive in fully.

Course Calendar and Reading Assignments

2/2 – Introduction to Learning and Concept Development

A review of the basics of learning and behavior

Serious Introductions: Provide your name, intended career path, what you hope to get out of this course, and a story about you at your best

Lecture: From Behaviorism to Social Learning: A Review

Readings: None

2/9 – Techniques in observation and ethnographic analysis

How do you observe people? How do you keep a lab notebook? How do you maintain objectivity?

Readings:

- 1) Kawulich (2005) ([link](#))
- 2) Roseberry & Warren: Ch. 5

NO CLASS ON 2/16

2/23, 3/2 – What are people?

How does culture affect how we learn?

Readings:

- 1) Facilitating Learning in Multicultural Teams -- Cseh 2003
- 2) Demonstrating the Value of an Organization's Learning Culture -- Marsick and Watkins 2003
- 3) The Learning Cafe-Engaging a Changing Workforce -- Sheef and Thielfoldt 2006
- 4) Roseberry & Warren: Ch. 10-12

3/9 – Language and discourse

Why is it so important to choose our words carefully?

Readings:

- 1) Roseberry & Warren Ch. 7-9

NO CLASS ON 3/16

3/23, 3/30 – Teaching and Conceptual Change

How do we enable others to develop and change their own conceptions?

Readings:

- 1) From Things to Processes – Chi et al. (1994)
- 2) Accommodation of a Scientific Conception -- Posner et al. (1982).
- 3) Roseberry & Warren Ch. 2-5

4/6 – Private Universes

How do we teach people to think about the science?

Readings:

- 1) <http://www.learner.org/workshops/privuniv/intro.html>

Presentation: Select one of the workshops (<http://www.learner.org/workshops/privuniv/>) and give a 5-10 minute presentation on that topic (use the sign-up sheet). How would you teach this topic to students in elementary, middle, and high school? What kinds of activities/tools/techniques might you use?

Discussion: What makes it so difficult to teach science and critical thinking?

4/13, 4/20 – Creativity and Critical Thinking

How do we create and evaluate new ideas?

Readings:

- 1) The 4-C model of creativity -- Kaufman & Beghetto (2009). (4/13)
- 2) Creativity -- Hennessey & Amabile (2010). ([link](#)) (4/13)
- 3) Creativity -- Cognitive, Personal, Developmental, and Social Aspects -- Simonton (2000). (4/13)
- 4) Videos on www.thefuntheory.com (4/13)
- 5) Essays about the Fun Theory (select one from [here](#) and bring it in for discussion) (4/20)
- 6) Open-minded inquiry -- Hare (2004). ([link](#)) (4/20)
- 7) The Critical Mind is a Questioning Mind -- Paul & Elder (1996). ([link](#)) (4/20)
- 8) The Role of Socratic Questioning in Thinking, Teaching, and Learning -- Paul et al. (1989). ([link](#)) (4/20)

4/27 – Single- and Double-Loop Learning and Metacognition

How do we learn how to learn?

Readings:

- 1) Chris Argyris: theories of action, double-loop learning and organizational learning -- Smith (2013). ([link](#))
- 2) Argyris & Schon's theory on congruence and learning -- Anderson (1994). ([link](#))
- 3) Teaching smart people how to learn -- Argyris (1991). ([link](#))
- 4) Metacognition and cognitive modeling -- Flavell (1979).

5/4 – Communities of Practice

Readings:

- 1) Communities of practice: A brief introduction – Wenger (2011).
- 2) Communities of practice: The organizational frontier -- Wenger & Snyder (2000). ([link](#))
- 3) Seven principles for cultivating communities of practice – Wenger et al. (2002).

5/11 -- Presentations

Please remember to do evaluations: <http://bit.ly/CCTEval>

The syllabus is subject to change at any time with notice from the professor.

References

- Anderson, L. (1997) Argyris and Schon's theory on congruence and learning. Retrieved 1/27/15 from <http://www.aral.com.au/resources/argyris.html>.
- Argyris, C. (1991) Teaching smart people how to learn. *Harvard Business Review*, May-June.
- Chi, M. T., Slotta, J. D., & De Leeuw, N. (1994). From things to processes: A theory of conceptual change for learning science concepts. *Learning and instruction*, 4(1), 27-43.
- Flavell, J. H. (1979). Metacognition and cognitive monitoring: A new area of cognitive-developmental inquiry. *American Psychologist*, 34(10), 906-911.
- Hare, W. (2004). Open-minded inquiry: A glossary of key concepts. *Inquiry: Critical Thinking Across the Disciplines*, 23(3), 37-41.
- Hennessey, B. A. & Amabile, T. M. (2010). **Creativity**. *Annual Review of Psychology*, 61, 569-598.
- Kaufman, J.C., & Beghetto, R.A. (2009). Beyond big and little: The four c model of creativity. *Review of General Psychology*, 13(1), 1.
- Kawulich, B.B. (2005). Participant Observation as a Data Collection Method. *Forum Qualitative Sozialforschung / Forum: Qualitative Social Research*, 6(2), Art. 43, <http://nbn-resolving.de/urn:nbn:de:0114-fqs0502430>.
- Paul, R.W., & Elder, L. (1996). The Critical Mind is a Questioning Mind. Retrieved 1/27/15 from <http://www.criticalthinking.org/pages/the-critical-mind-is-a-questioning-mind/481>
- Paul, R.W., Martin, D., & Adamson, K. (1989). The Role of Socratic Questioning in Thinking, Teaching, and Learning. Retrieved 1/27/15 from <http://www.criticalthinking.org/pages/the-role-of-socratic-questioning-in-thinking-teaching-amp-learning/522>.
- Posner, G. J., Strike, K. A., Hewson, P. W., & Gertzog, W. A. (1982). Accommodation of a scientific conception: Toward a theory of conceptual change. *Science education*, 66(2), 211-227.
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- Smith, M. K. (2013). Chris Argyris: Theories of action, double-loop learning and organizational learning. *The encyclopedia of informal education*. Retrieved 1/27/15 from <http://infed.org/mobi/chris-argyris-theories-of-action-double-loop-learning-and-organizational-learning/>.
- Wenger, E. (2011). Communities of practice: A brief introduction.
- Wenger, E., McDermott, R., & Snyder, W. M. (2002). Seven principles for cultivating communities of practice. *Cultivating communities of practice: A guide to managing knowledge* (pp.49-64). Boston, MA: Harvard Business School Publishing.
- Wenger, E. C., & Snyder, W. M. (2000). Communities of practice: The organizational frontier. *Harvard Business Review*, 78(1), 139-146.