WHY IS CRITICAL THINKING SO HARD FOR STUDENTS TO LEARN? HOW WE CAN HELP?
Fostering Critical, More Effective Communication, Better Decision Making and More
TEACHING AS IF YOUR JOB DEPENDED ON IT

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My teaching papers listed http://iub.academia.edu/CraigNelson/CurriculumVitae Especially pertinent today:

Focuses directly on Higher-Order C.T. Literature review is now dated.

More up to date: Active Learning, Misconceptions, Basic Reasoning, Complex Reasoning & Controversial Issues. Broadly applicable, not just about evolution.

TODAY: Sophistication in thinking is prerequisite to many of the goals of liberal and professional education including critical thinking, mature valuing, effective oral and written communication and much more. The basic question is: Why are sophisticated ways of thinking so difficult for students to acquire? We will examine two major frameworks for fostering critical thinking and related skills. However, help with cognitive frameworks is only half of our challenges as teachers. For most students, critical thinking is a deeply social enterprise. The most dramatic gains by far come changes that also carefully structured discussion and other aspects of social dynamics. An underlying theme will be that critical thinking can often be fostered best by increasing the ratio of support offered for a given level of challenge. This approach applies to ALL students but is even more important for those from non-dominant backgrounds. Mini-lectures will alternate with writing and small- and whole-group discussions of examples and implementation. Participants will be asked to consider and discuss how these approaches might apply in their own teaching, perhaps as soon as Monday morning.

AS IF YOUR JOB DEPENDED ON IT: THE STAKES

“Fifteen years from now more than half of the universities will be in bankruptcy, including the state schools. In the end, I am excited to see that happen.” Harvard business prof Clayton Christensen

Christensen on disruption: “If they (newcomers) come in at the bottom of the market and offer something that at first is not as good, the legacy companies (colleges and universities) won’t feel threatened until too late, after the newcomers have gained a foothold in the market.” Quotes from “Disruption guru Christensen: Why Apple, Tesla, VCs, academia may die.” http://www.bizjournals.com/sanjose/news/2013/02/07/disruption-guru-christensen-why.html?page=all

In short, disruptive innovations do not need to be nearly as good as the best. They only need to be cheaper than and about as good as the cheapest now available (the bottom of the market). The problem for traditional higher education is that some of the new systems already are both cheaper and better than many of our “bread and butter” courses. Some developments:
• Massively Open Online Courses much publicity. Not a threat? But enhancing disruptive practices.
• Individualized, Computerized (Online) instruction. Adapts to student and some learn from students. Pearson and Arizona State. Algebra. Some facilitators 100% full-mastery pass rates.
• Automated (Online) assessment. Including grading essay questions. May be better than faculty?
• Minimally tutored, competence rather than courses. Western Governors University (of Indiana).
• Related “Badges” of completion versus credits. E.g. MIT online, free courses.
• California Community Colleges. Developing fully online versions of ALL academic (university equivalent) courses.
• Statway™ and Quantway™ Replace developmental math with more challenging and much more successful courses. [“Community College Pathways: 2011-2012 Descriptive Report”]

OPENING EXERCISES

• Harvard students, pre-selected re ability & effort.
  What do you think are two main causes when they get into academic difficulty?

• Your Department or Program: Faculty’s ideas of 2-3 main reasons that students don’t excel at CT?
EXERCISE: CHOOSING YOUR HIGHER-ORDER OUTCOMES

• Circle Three Outcomes That Are Very Important For Your Courses. [1-15 From AACU]
• Star (asterisk) Three Outcomes That Are Very Important For New MDC Graduates
• Explain for at least two why that outcome is so important (2 or 3 sentences).


• Intellectual and Practical Skills:
  1. Inquiry and analysis.
  2. Critical thinking.
  3. Creative thinking.
  4. Written communication.
  5. Oral communication.
  6. Reading.
  7. Quantitative literacy.
  8. Information literacy

• Personal and Social Responsibility:
  11 & 12. Civic knowledge and engagement—local and global,
  13. Intercultural knowledge and competence
  14. Ethical reasoning

• Foundations and skills for lifelong learning:
  15. Integrative and Applied Learning

• I would add:
  16. Complex decision-making,
  17. A responsible self
  18. Collaborative interpersonal interaction.

• You may wish to add one or two:
  19. _____________________________________
  20. _____________________________________
As If Your Job Depended On It: What can we do?

KEY RESULTS FROM THE SCHOLARSHIP OF TEACHING & LEARNING

1. Most Seniors graduate from all four-year college programs UNABLE to do such outcomes.
   75-80% don’t use them spontaneously within courses, over 95% don’t use them outside courses

2. Higher level outcomes can be taught effectively in college programs but only if individual courses use “backwards” course design (put the horse before the cart):
   Outcomes → Assessment Focus → Assessment Exercises (using just the appropriate content)

3. The most effective curricula link sequential courses with increasingly challenging outcomes
   University of Central Arkansas: Honors, One outcomes focused seminar each semester


4. SO FAR, Faculty seem to be essential to developing higher order outcomes, if we would just DO IT.

5. There is VERY extensive research on the development (or not) towards higher order outcomes

First major work:

From Perry’s SOTL study to a Major Research Program [Perhaps 1000 papers and some 20 books!]
B. K. Hofer & P. R. Pintrich (Eds.). Personal epistemology: The psychology of beliefs about knowledge and knowing Lawrence Erlbaum Associates. [Several good review chapters on alternative approaches.]
For use by students and mentors

Several Key Perspectives Require Similar Development
Religious (Fowler) & Multicultural (Bennett) Functioning.
Professional Ethics, Managing, Working In Organizations, Parenting &Partnering (Kegan)

I have tried to summarize how to apply these results to course design
As If Your Job Depended On It: What can we do?

“BACKWARDS” COURSE DESIGN
(Putting the horse before the cart)

Outcomes → Assessment Focus → Assessment Practice Exercises (just the appropriate content)
Select most important Higher Level Outcomes (5 or fewer?).
Decide how you want to students to demonstrate each: How you will assess each outcome.
Practice exercises for doing the outcome fully in ways that practice the assessment.
Use the only the content that will best allow you to do this until master outcomes.
Content itself is now available on web and is relatively easy to learn. 50% is the new 100%.

• Robert Kegan & Lisa Laskow Lahey. 2009. Immunity to Change: How to Overcome It and Unlock the Potential in Yourself and Your Organization. Harvard Business Press. Pages 109-123: The Medical School: Summary of Bowe et al. (2003 a & b); includes many of the key tables. “We agree what and how it would be best to teach future doctors—but we aren’t doing either.” Faculty were already convinced that reformed teaching was ideal and desirable, but …

KEY TOOL FOR HIGHER LEVEL OUTCOMES: EFFECTIVE USE OF RUBRICS
• Rubric task must match and demonstrate desired outcome.
• Give rubric and give practice sets to rate with feedback before doing assignments.
  This does not mean explain the rubrics. Instead, you have to provide meaningful, guided practice.

EXERCISE: ASSESSING YOUR HIGHER-ORDER OUTCOMES
Start with one of the outcomes you selected on page 2.
How do you or might you do a final assessment of how well the students can do it?
How do or might you actively provide meaningful, guided practice in doing this assessment task?
Note: Guided practice, NOT just tell them how to do it! NOT just hope they will get it somehow
Should you look at related VALUE Rubrics and see if you can adapt and then teach them?

Depending on how rapidly you answer for one outcome, you may want to go on to others.

ANOTHER FRAMEWORK FOR FOSTERING CRITICAL THINKING:
ACTIVELY TEACH CORE ACADEMIC TASKS

Key Problem 1: Many students don’t understand how to do core academic tasks. [Perry. Harvard]
Key Problem 2: Different courses and disciplines have very different tacit expectations for these.
Key Problem 3: Most students who are well prepared had several related advanced courses in HS. When I didn’t teach these skills I handicapped students from under-powered backgrounds.
Key Response: Teach students how to do your core academic tasks including critical thinking.
  = Get most or all students do what successful (often privileged) students learned to do earlier.

EXAMPLE: Outcome: Reading for understanding v reading for “what it is about.”
Assessment: Summarize an argument (critique it comes later). Guided practice:

[Study Guide] The first task here is to understand clearly what Anderson says. Then, the task becomes evaluating and applying his ideas. Evaluating does not mean saying whether or not you feel Anderson is right. Rather it means explicitly explaining on what criteria Anderson's argument is strong and on what criteria it is weak. A part of doing this is sometimes to compare his argument with your own experience and knowledge.

STUDY QUESTION FOR P 4-5.

** 2. "The conservative indictment is correct, and yet the strategy that follows from it,..., is doomed to fail." Summarize (i) the indictment, (ii) the strategy, and (iii) the reasons Anderson offers for its inevitable failure. So what, according to Anderson? [Comments in brackets will NOT be on the quiz.] [Include, in your discussion of the reasons for failure, both diversity and the ultimately self-defeating aspects of the strategy.]

TEXT p 4-5 (part):

In small towns all across America, modern and postmodern culture do battle: neighbor turns against neighbor in bitter disputes about whether children should be taught skills of "moral reasoning"--a very postmodern concept--or should instead be taught to accept unquestioningly some rock-solid American values and beliefs. In the circles of higher education, the case is stated by books such as Bloom's The Closing of the American Mind, which hammer at the postmodern relativism that (Professor Bloom says) abandons fundamental political principles in favor of a wishy-washy flexibility and recognizes "no enemy other than the man who is not open to everything." Bloom recognizes- and is alarmed by-the extent to which the old view of reality has eroded: "Almost every student entering the university believes, or says he believes, that truth is relative."

Bloom's indictment is quite correct, in a way: most people in Western society today do hold a much more relativistic view of reality. And he is also justified in charging that few of them understand the full implications of this profoundly radical epistemology and instead wander around in a muddled good-guy liberalism that has no clear concept of truth and think all the world's problems would melt away if we just had a tad more tolerance. A postmodern worldview is present among us, yet unformed: it knows neither its own strengths, nor its own weaknesses. We do not know how to live in a world of socially constructed realities, yet we find it increasingly difficult to live in anything else.

The conservative indictment is correct, and yet the strategy that logically follows from it--to rebuild consensus, to get a core of standard values and beliefs in place in every American mind-- is doomed to fail. To see that, you only need to look at the variety of things being offered by people who are in favor of some such consensus building: Professor Bloom offers a restoration of classical Western civilization, and his idea of culture leans strongly to the right. Frances Moore Lappe in her book Rediscovering Americas’ Values pleads for a similar return to cultural roots, but her version leans equally to the left. Robert Bellah and his coauthors of Habits of the Heart want Americans to become less individualistic, more settled and community based, to stop wandering around. James Fallows in More Like Us argues for restoring the old American "sense of possibility and openness," our tradition of mobility, our willingness to head for a new job or a new town and start all over. E. D. Hirsch, Jr., in Cultural Literacy proposed a list of things we all ought to know about, from Hank Aaron to Zurich, in order to be "culturally literate." Other writers criticize Hirsch's list for being too white-and European-oriented and propose other lists of items from non-European traditions. Still others counsel us to create and unite around new values based on feminism or ecology. All of these proposals make sense, in a way. Each of them looks good to certain groups of people, particularly those whose values and beliefs are the ones being proposed for the national culture. And I am sure the great majority of Americans have never heard of any of these people, or their books.

Humpty-Dumpty is not going to be put back together again. Efforts to do so are ultimately self-defeating, because campaigns to make people choose any particular system of value and belief tend to have the subversive effect of informing people that they are free to choose systems of value and belief. All too often, indoctrinations--even indoctrinations into traditional principles--turn out to be de facto courses in postmodernism.

The metaconflict about beliefs has become a central theme in American politics, and it also echoes around the globe: we can see it in the travails of the Catholic church as it struggles to hold the line against radically new ways of looking at revealed truth, in the reluctant and explosive deflation of doctrine of Marxist nations, in the worldwide proliferation of spiritual and psychological cults that offer new certainties to people ....
Fostering Complex Critical Thinking, Mature Valuing, Effective Communication & More

FRAMEWORK: ADULT COGNITIVE (HOLISTIC) DEVELOPMENT: PERRY +

Four Modes Of Thinking Relevant To Undergraduates

After Perry (1970), Belenky et al. (1986), King & Kitchner (1994) & Baxter Magolda (several)

Nuclear Power as an Example

Baxter Magolda:

2/3 1st yr., ~ ½ of 2nd

SGT. FRIDAY [DUALISM]

Nuclear Power Either a) Is Really Safe or b) Should Be Totally Banned

One Authority has the Truth: Get the answer from THAT Authority—Teacher, NOT peers

Do not expect to understand WHY an authority supports a particular answer: Just tell me what to learn (memorize)!

Transitional (Mix of D & M)

~ 1/3 1st Yr., ~ 80% Seniors

BASKIN ROBBINS [MULTIPLICITY]

Opinions—All Are Equal & Deserve Equal Time

Nuclear Power: Why Argue? Just Respect Each Other!

Each Person's Views are Right For Her: Any view is valid if someone likes it (ice-cream style like).

Students: TEACHERS' GAMES [CONTEXTUAL RELATIVISM]

~ 1/6 of Seniors

Making Arguments: Let's Really Understand Everyone's Arguments & Frameworks

Nuclear Power: Environmentalists argue that …. Whereas economists …

Within a Game [Framework]: Many opinions are terrible; Some may be strongly supported.

BUT: All internally-coherent games SEEM equally good: Economics, Environmental …

OWNED GAMES

~ 2% of Seniors

Some Frameworks / Combinations Are More Appropriate For Particular Contexts

How We Choose Better v Weaker Among Internally-Coherent Games

Nuclear Power: Safe Enough for some uses (Submarines)

But not safe enough for others (Power-plants in urban areas) Because …

EXERCISE

On What Parts Of This Spectrum Do The Demands Of Your Courses Currently Fall?
Will That Advance Students To Where You Want Them When They Graduate?
CRITERIA AS FUN [WORKSHEET FOR LEARNING GROUPS]

[Context: Senior course/ Much prior practice using these criteria re better ideas.
Class met three times per week. Two lecture-discussions
One “learning group” used small group discussion based on structured worksheets.
Evaluation: Quick, minimal marking. “Red Pen” approach. All comments in class in red-pen. ]

Before class:
• Write out answers to all questions.
• Examples can be from any non-scientific area including incidents that might cause jealousy, sports, consumer goods, mechanics, business decisions, crimes, mystery novels, issues for/with parents, etc.
• Criteria for better answers:
  1. The examples accurately illustrate the criteria.
  2. The examples are interesting (non-trivial, help one understand).
  3. And the examples are fascinating or funny.

In Class: Discuss in Assigned Groups--Modify Worksheet With Red Pen

1. Explain the two criteria: Fair tests and Multiple Independent tests.
   State what basic task each criterion could be used for outside of science.
   State a specific non-scientific question to which these two criteria could be or has been applied.
   Explain at least two alternative possible answers to the question.
   Explain at least two potential fair tests and indicate which conclusion would be supported by what results from each fair test.

2. Explain the Criterion: Explanation of anomalies.
   State what basic task this criterion could be used for outside of science.
   State a non-scientific anomaly to which this criterion could be, or has been, applied.
   Explain how the anomaly was resolved OR a way in which one could try to resolve the anomaly.

3. Explain the criterion: Showing that a larger, separately confirmed, causal framework predicts or explains the results.
   State what basic task this criterion could be used for outside of science.
   State a specific, non-scientific question to which this criterion could be applied and explain how that would work.

4. Explain the criterion: The fair test that supports the conclusion is itself especially strong.
   [For example, it has several internal checks on validity.]
   State what basic task this criterion could be used for outside of science.
   When is it most important?
   Explain two, specific, non-scientific examples of tests that are particularly strong (for each, give the question, the alternatives, and the test and explain why the test is especially strong.)

5. Explain the difference between ad hoc and untestable.
   State what basic task these criteria could be used for outside of science.
   List two specific examples of non-scientific ideas that are both ad hoc and testable.
   [Note that this says testable, not untestable.]
   List two specific examples of non-scientific ideas that untestable.

• Key Take-Home Points? What would you say if asked about the importance of this example?
<table>
<thead>
<tr>
<th>Summarize the Author's Argument.</th>
<th>Evaluate the Strength of Evidence.</th>
<th>Burden of Proof: Accept-until-falsified or Reject-until-supported? Why? (Positive and negative consequences, applications and societal impacts).</th>
<th>Decisions: Compare the Strength of Evidence to the Level of Proof and decide whether you will accept or reject:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Use complete sentences. List each main point separately. State as if you were the author (not “the author thinks...”, “she says...”, etc.)</td>
<td>A. List the factual claims relevant to each main point separately. Evaluate each: very solid, solid (normal science), suggestive, plausible, improbable, very improbable. Explain (quality and quantity of data? Other relevant support?) B. Evaluate the strength of support for the overall argument. (Internal consistency? Alternative hypotheses excluded? Overall probability?)</td>
<td>Level of Proof: Normal (5%). Stronger or Weaker? Why? A. For each point separately: B. For overall argument.</td>
<td>A. the main points separately, and B. the overall argument.</td>
</tr>
</tbody>
</table>
WHY IS CRITICAL THINKING SO HARD FOR STUDENTS TO MASTER?

1. Faculty members usually are not focusing effectively on fostering higher-order outcomes. Requires “Backwards Design.” Select outcomes. Then how assess them. Only then pick content.

2. Thinking more effectively is only partly about thinking. “You can never go home again.”
   - Adopting new culture easier if feel personal connection to your guide, as in graduate school.
   - Note: This applies to all students but is even more important for those from non-dominant backgrounds. “From the middle of my first semester they called me their little coconut.”
   - Further: You can go home better as you master more advanced stages of thinking and being. Context-appropriate code-switching (v I just have to be me).

A DYSTOPIAN VISION FOR THE FUTURE OF COLLEGE EDUCATION

“Fifteen years from now more than half of the universities will be in bankruptcy, including the state schools. In the end, I am excited to see that happen.” Harvard business professor Clayton Christensen

A UTOPIAN VISION FOR THE FUTURE OF COLLEGE EDUCATION

- Systematic ongoing improvement: Formative Classroom and Curricular Assessment
- Take fostering higher-level outcomes seriously: “Backwards” Course Design
- Personal connections to faculty become as core for undergraduates as they now are for many graduate students. Required by most students for cognitive and personal growth.
- Isn’t it worth a real try?

Uncertainty: Key books and articles.
SOME IMPORTANT BASIC RESOURCES [TAKE-HOME]

AIM HIGH: Focus on Major Outcomes


“BACKWARDS DESIGN.” Use one of these in Designing or Revising a Course:


IS IT WORKING? ASSESS AND DOCUMENT WHAT IS HAPPENING IN YOUR CLASS

Treat ALL assessments as measures of the success of the learning design.

Use Some “CATs:” Check on how any course is actually working:


Course Portfolios.

• Daniel Bernstein et al. 2006. Making Teaching and Learning Visible: Course Portfolios and the Peer Review. Anker.

LOOK BROADLY Two Major Collections of Teaching Resources:


GREAT FIRST DOWNLOADS: Each offers free summaries of research on key topics

• IDEA Papers. Topics include Improving Lectures, Improving Discussions, Improving Essay Tests, Improving Student Writing, Improving Grading, Evaluating Teaching and many more. 4-8 pages each, feature both techniques and introduction to literature. Free PDFs http://www.theideacenter.org/category/helpful-resources/knowledge-base/idea-papers
• POD-IDEA Center, Notes on Instructional Improvement. Free PDFs. http://www.theideacenter.org/node/64

BOOKS TO USE WITH STUDENTS (All on Amazon)

• Authoring Your Life: Developing an Internal Voice to Navigate Life's Challenges. Marcia B. Baxter Magolda, Matthew Henry Hall & Sharon Daloz Parks (2009)**
• Integrations: Reading, Thinking, and Writing for College Success by William S. Robinson & Pam Altman (2002)
• Learning to Communicate in Science and Engineering: Case Studies from MIT. Mya Poe, Neal Lerner, & Jennifer Craig (2010) *
• Thinking Ahead for College Success: A First Year Student's Guide. Thomas B. Jones (2011) *