Improving Student’s Critical Thinking

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Background and Purpose
Critical thinking enhances students’ professional problem-solving skills, participation in democratic processes, and refines the individual’s capacity to make sound personal decisions. Employers recognize the value of critical thinking and have asserted that colleges and universities need to do a better job of addressing these skills. In 2007, a study of 301 companies with 25 employers or more opined that 31% of the college graduates they hired were not well-prepared to think critically.

In 2005, the Association of American Colleges and Universities launched the Liberal Education and America’s Promise (LEAP) initiative in order to foster a stronger alignment between the needs of the global economy and educational goals. This initiative introduced High-Impact Educational Practices which are designed to maximize student engagement, the alignment between community and learning experience, and to improve critical thinking.

Instructors who believe that undergraduate studies ought to improve students’ ability to think critically are challenged in many ways. In a 1997 study of university faculty, researchers found that while 89% declared that critical thinking is a primary objective of their own teaching, only 19% could elaborate on what they meant by critical thinking, and that 77% “provided limited or no conception of how to reconcile content coverage with the fostering of critical thinking.” In addition, while 81% indicated that their department’s graduates achieved high levels of critical thinking while in their program, only 20% reported that their departments shared a common approach to critical thinking.

The purpose of this tutorial is to improve instructor’s understanding of critical thinking, to prompt reflection on the matter of how to improve instruction directed toward critical thinking, and to introduce instructors to vital steps in designing course work dedicated to critical thinking.

6 Ibid.
Outcomes
1. Participants will describe their understanding of critical thinking, how critical thinking is viewed in their own disciplines, and how critical thinking is currently integrated into their curricula
2. Participants will identify elements and standards of critical thinking and the intellectual traits that attend critical thinking
3. Participants will explore strategies to improve their teaching of critical thinking and to build learner-centered critical activities into their course design

Take a moment to reflect:
1. What is your understanding of critical thinking and how is it applied in your discipline?

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2. Identify one or two activities in which you explicitly teach students about critical thinking or engage them in an activity that will culminate in explicit guidance and assessment of critical thinking:

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3. In your estimation, what percentage of the course was specifically designed to teach and immerse students in activities that cultivate critical thinking skills and what challenges do you think present significant obstacles to teaching critical thinking in your courses?

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Can Critical Thinking Really Be Taught?
Jacques Barzun, historian and educator, cautioned those who wished to become teachers that one of the greatest misfortunes of modern American education is that it tended to adopt John Dewey’s idea that all thinking is problem-solving. In Dewey’s paradigm, the individual encounters a difficulty, defines the problem, generates a hypothesis, establishes the methods with which to solve the problem, gathers the data, and proves or fails to prove the hypothesis. Barzun opined:

...[T]he greater part of thought does not deal with problems. We have all got the habit of calling every purpose of difficulty a problem, to the point however where some people upon hearing “Thank you” no longer say “You’re welcome,” they say “No problem.” A problem is a definable difficulty; it falls within certain limits and the right answer gets rid of it. But the difficulty—not the problem—the difficulty of making a living, finding a mate, keeping a friend who has a jealous cantankerous disposition cannot be dealt with in the same way—it has no solution. It calls for endless improvisation, some would say “creativity.” So we come to the conclusion that the mind is at its best thinks not like Dewey’s imaginary scientist, but like an artist. Art is achieved not by problem-solving but by invention, trial and error, and compromise among desired ends—just like good government. We may thereby gauge how far from practical is the opinion that if we teach problem-solving, or critical thinking, we shall equip young minds for dealing with all of life’s predicaments.

A reasoned approach to the task of teaching critical thinking must acknowledge that there are frequently no solutions, no single absolute moral courses of action, and that sometimes the greatest challenge of the human being is to live with unalterable conditions and to cope with ambiguity.

To introduce students to the complexity of critical thinking, it may be helpful for them to organize the broad spectrum of considerations that attend critical thinking into specific cognitive tasks that represent things individuals think about when they are thinking critically. These cognitive tasks can be very general and apply to many disciplines, such as the task of assessing the accuracy of assertions or deciphering the implications of claims, or they might be very subject-specific, such as the historian’s task of determining the authenticity of a source, or the economist’s task of assessing whether a particular economic concept was used appropriately by a politician in a campaign speech. Like all skills, cognitive tasks require abundant rehearsal for mastery. Designing courses that reinforce the tasks requires instructors to target specific cognitive tasks for development and to construct lessons that will allow students to practice their skills and receive ample corrective guidance and assessment. Sometimes the most profound lessons arise from spontaneous exchanges in the classroom wherein students must respond to moral absolutism or paradox and the instructor allows for students to experience the discomfort of silence and uncertainty or the luxury of taking a few moments to quietly reflect upon their thoughts and discuss them with others in an atmosphere that allows for respectful disagreement and dissent.

A scholarly approach to critical thinking will help students understand that:

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8 Ibid, p. 47.
• Ambiguity is a normal experience and that those who experience it have not necessarily failed to think critically
• Judgments cannot always be made or issues resolved by taking simple steps and by applying a one-sized-technique-fits-all approach to problem-solving
• The existence of ambiguity does not excuse people from having to think critically and why this is true
• Critical thinking requires open-mindedness, tolerance, and humility

**Defining Critical Thinking**

While there are multiple definitions for critical thinking, there exists a consensus on the idea that critical thinking is a willed, cognitive activity dedicated to making reasoned judgments by conducting analyses and by monitoring our own thought processes and emotional responses.  

In a 1991 Delphi Study, experts concurred that good critical thinking included the cognitive skills in 1) interpretation, 2) analyses, 3) evaluation, 4) inference, 5) explanation, and 6) self-regulation. The study also declared:

*There is a consensus that one might improve one’s own critical thinking in several ways. The experts agree that one could critically examine and evaluate one’s own reasoning process. One could learn how to think more objectively and logically. One could expand one’s repertoire of those more specialized procedures and criteria used in different forms of human thought and inquiry. One could increase one’s base of information and life experiences.*

Paul and Elder identify **eight elements of thought** involved in critical thinking. These elements represent the specific questions critical thinkers address as they encounter assertions and receive information.

1. **Purpose**: Addresses the goals, objectives, and function of the assertions and the thinking one undertakes
2. **Question at Issue**: Identifies the cardinal issue, problem or condition that is central to the assertion or the thinking
3. **Information**: Regards the data, facts, knowledge, and experiences required to understand and to make sound judgment and decisions
4. **Interpretation and Inference**: Considers the basis of one’s conclusions and examines the consistency of one’s inferences and the links between the evidence and one’s conclusions
5. **Concepts**: Addresses the need to have a clear sense of concepts that are germane to the assertions and thinking and what alternative concepts or alternative views of concepts might be valid

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10 Ennis, R. H. (1964, A definition of critical thinking. The Reading Teacher, 17 (8), 599-612.
12 Ibid.
6. Assumptions: Speaks to the need to examine one’s assumptions when assessing assertions and one’s own thinking; it examines the presumptions and facts, and conditions that one brings to one’s thinking
7. Implications and Consequences: Addresses the potential results a course of thinking or action might generate and what a given way of thinking suggests about events, conditions, decisions, or problems
8. Point of view: Considers the potential biases that might impact thinking and also is concerned with understanding the perspectives of all stakeholders in matters

Paul and Elder identify **standards of thought** that are applied to one’s thinking in order to its quality.\(^\text{14}\)

One might conceptualize these standards as criteria against which thinking could be assessed:

1. Clarity: Regards the way we see the issues, questions, and assertions; in clarifying we ask, “Could you elaborate? Could you give me an example or state that in another way?”
2. Accuracy: Regards the veracity of assertions and asks the questions of whether the data is complete or whether there are ways to double check our information.
3. Precision: Paying attention to details, pursuing specific information; reinforces accuracy and clarity
4. Relevance: Attends questions of how the idea and thinking will bear on matters; how are issues connected to the central question?
5. Depth: Explores the complexity of the issues, problems, questions; addresses some of the difficulties with understanding matters
6. Breadth: Inquires as to the scope of perspectives needed for full understanding; examines need to examine things from alternative points of view
7. Logic: inquires as to the reasonableness of assertions and whether an argument or presentation follows a consistent and rational thread of thinking; examines the strength of evidence presented
8. Significance: Assessing whether all issues or ideas that surface are important to consider; determining which assertions, facts, or ideas represent the central issues
9. Fairness: Asking whether we have a vested interest in the matter that might impact our judgment and whether we can be equally sympathetic to all points of view and open to all ideas and facts

Paul and Elder offer readers a list of **intellectual traits** that enhance the capacity for one to think critically; these are:\(^\text{15}\)

1. Intellectual humility and the ability to recognize the limits of one’s knowledge and an awareness of how one is vulnerable to one’s own egocentricism
2. Intellectual courage entails a conscious awareness of the need to address issues despite the possibility that others find them unpopular or absurd
3. Intellectual empathy is the ability to place ourselves in the place of others and the correlates remember times in the past when we were wrong when we were thought we were right
4. Intellectual autonomy refers to one’s control over one’s own beliefs and thinking
5. Intellectual integrity refers to the need to be faithful to one’s thinking and beliefs and to hold one’s self to high intellectual standards

\(^{14}\) Paul and Elder, 2011.
\(^{15}\) Ibid.
6. Intellectual perseverance is recognition of the need to peruse one’s thinking and inquiries despite difficulties and obstructions
7. Confidence in reason is having faith that everyone’s interests are best served by giving people the chance to reach their own conclusions and persuasion is best when rational and considered
8. Fairmindedness regards the ability to view matters without prioritizing one’s vested interests, national agendas, or social norms; it seeks an objective view

Seven Steps on How to Integrate Critical Thinking into the Curriculum

1. Regarding Students Needs
Each group of students comes to your class with different experiences, prior knowledge, and skill. While it is helpful on the first day of class to present a syllabus that is highly detailed, it is also wise to state the course outcomes relative to critical thinking in terms general enough to flex according to students’ needs. Getting a sense of students’ needs may require instructors to pre-test students to read what they write about their understanding of critical thinking. Making assumptions about what they know may compromises the effectiveness of your instruction, no matter how well you prepared for your lessons. Get to know how they think; be able to describe their ability to make inferences, detect implications, identify biases, discern the cardinal ideas from the peripheral, recognize faulty logic, etc.

2. Establishing Clear Outcomes
Objectives speak to the general purpose of the course and general aim. Outcomes address specific things that students will do as a result of their instruction, such as: 1) trace the chronology of the Civil War; 2) produce a short animated film; 3) demonstrate the procedures for assessing range of motion; and, 4) evaluate the merits and limitations of the U.S. foreign policy towards Iran. In establishing outcomes relative to critical thinking, start with the questions:

- How does the course fit into the overall program?
- What particular critical thinking skills are needed are essential to learn at this stage of the program? Is it important, for example, to help students experience ambiguity and how to respond to it intelligently? Is it vital for them to know at this state how to assess the veracity of claims and the logic of assertions and strength of evidence to back them?
- What do the external professional agencies of the target profession (Nursing, Accounting, etc.) identify as vital critical thinking skills and competencies?

3. Aligning Outcomes and Assessments
In planning the course, instructors must be clear about how student mastery of critical thinking skills will be assessed before the instructor designs the activities that will prepare students to demonstrate or articulate their learning. A professor interested in getting students to improve their critical thinking might identify six discrete cognitive tasks, for instance, and decide the best way to assess how well students perform these tasks would be to examine how well they have analyzed political essays or

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scholarly articles. The performance on reading tasks is proxy for the critical thinking, as critical thinking cannot be directly observed.

4. Choosing Appropriate Activities
Since the outcomes target specific cognitive tasks associated with critical thinking, and since the instrument that will be used to assess students proficiency with these tasks, the course work is obligated to prepare students to do well in their assessments. Instructors must see that class exercises, readings, and all class activities provide ample opportunities for students to improve their understanding of the tasks and for students to rehearse their skills and receive formative critiques of their work.

5. Mapping the Course Terrain
Organizing the introduction of material, the opportunities for students to articulate their understanding and to improve their metacognition of their own learning process requires instructors to decide not only the sequence of events and the pace at which the sequence will be completed, but what indicators will be considered as the professor determines students are ready to advance or whether students will need to spend more time with a given task.

Instructors also determine the proper way to order lessons so that discrete skills are introduced at the appropriate moment, augmented and embellished at the right moment, synthesized at the right moment, and then augmented again. This is form of scaffolding requires instructors to understand the specific differences between excellent and poor work and everything in between. It also requires instructors to determine the degree of explicitness students require in order to learn and how to bring them to the place where they can demonstrate proficiency without being dependent on explicit direction and cues.

In mapping the course with the intention of teaching critical thinking skills, the instructor consciously and deliberately embraces the idea that skill-building, and not just the dissemination of information, is a central element in the course. In essence, the instructor welcomes the skill-building as course content. This may be a radical departure from the way instructors have approached teaching. Many instructors have regarded the information or facts presented in a book or on-line sources as course content while skills were pepped into the lessons as rather marginal or incidental experiences.

6. Dedicated Dip-Sticking
Frequent formative assessments allow for students to track their progress and gain a deep understanding of the difference between work that is satisfactory and work that is exemplary. These assessments offer students the chance to receive critical feedback on their work before their work generates a summative grade. Frequent “dip-sticks” are relatively short and concise exercises that target a specific skill. In the case of critical thinking, the exercise might be an in-class assignment in which students read an article or portion of a speech and are set to task to identify the biases, relevance, implications, or significance. The exercise is immediately followed with an in-class guided analysis of what students found and discussion in which students are prompted to explain and justify their assertions or to see the material from different perspectives. A second method of “dip-sticking” involves student feedback. Even before the end of the semester, when course evaluations are typically
distributed, instructors may take time in class to have students respond to questions that probe their understanding and experience with the instruction. The instructor may ask, for instance:

- What is your understanding of critical thinking at this point in the class?
- What materials and which exercises have helped you understand critical thinking the most?
- What materials and which exercises seem most difficult for you?
- What questions do you have at this point about critical thinking?

In taking time to address the responses in class, the instructor affirms the value of student input to course design and gains a sense of what might be critical next steps in the course work.

7. **Evaluating Yourself**

As with all learner-centered instruction, professors improve their understanding of student needs and progress by evaluating their work and examining the implications their achievement has for instruction. Instructors who want to improve students’ critical thinking, therefore, must pay close attention to what exercises, materials, and experiences helped students the most and which may need revision. In such evaluations, the instructor embraces the idea that courses are fluid and dynamic and that what works for one group of students may not work for another; the instructor also remains open-minded to student evaluations and the potential that the course design may need some adjustments.

**Key Principles of Learner-Centered Instruction on Critical Thinking**

1. Be clear and specific about the learning objectives
2. Understand students’ prior knowledge and beliefs about why critical thinking is important
3. Be explicit about the elements and standards of thinking (i.e., this exercise will improve your ability to detect implications or to recognize biases)
4. Demonstrate how critical thinking is applied to various academic and professional tasks
5. Allow students to rehearse their skills without penalty as to create habits of mind so that in the future they may be able to complete the work of critical thinking independently without the aid of specific prompts and guidelines

**Take time to reflect:** In what ways could you intentionally build critical thinking into your course work and make the critical thinking an explicit part of your instruction as to improve students own metacognitive processes?