



Why Ask “Why?”: Critical Thinking Across the Disciplines

Introduction

Critical thinking is valuable when preparing students for academic and economic advancement. Critical thinking is also valuable for intrinsic reasons as part of living a good life. Despite the fact that we are faculty members in different areas (biology, economics, and philosophy), we each encourage our students to ask “Why?”. We also recognize that there are challenges to teaching critical thinking that go beyond an individual instructor’s acumen or ability, however adept, to be innovative with curriculum. These challenges call for a broader conversation about how faculty ought to cultivate their students’ willingness to ask, “Why?”. This essay is meant to begin such a conversation. First, we will discuss what critical thinking is not and then discuss what critical thinking is. Second, we suggest why fostering critical thinking across the disciplines is a worthy endeavor. Third, we discuss some discipline-specific challenges to promoting critical thinking in students and possible solutions.

Critical Thinking

Critical thinking is a fundamental academic skill in all education levels. However, it is particularly salient in college-level education. It is not possible to give a precise definition of critical thinking, but we are able to say what critical thinking is not:

- Critical thinking is not memorizing and regurgitating information from a textbook or class lectures. Although there should be some rote work in a classroom, memorization and regurgitation is antithetical to critical thinking.
- Critical thinking is not criticism of people. There is a difference between questioning ideas and arguments, and attacking the person making an argument. Attacking the person instead of their ideas is an intellectual failing.
- Critical thinking is not expressing our prejudicial beliefs. Since humans believe in many things, some good and some bad, expressing prejudices only serves to reinforce preconceptions and biases.

What, then, is critical thinking? Our definition (loosely adopted from Lewis Vaughn’s in *The Power of Critical Thinking*) is that critical thinking is a systematic examination of beliefs and claims, arguments, theories, and

explanations. There are two key features to this definition. The first is the systematic nature of examination: critical thinking involves careful examination rather than a hasty glance. The second feature is that critical thinking involves examining one’s own beliefs, statements, theories, arguments, evidence, or hypotheses. Since not all views, statements, arguments, evidence, or hypotheses are equal, we need some general basis from which to evaluate those beliefs. Generating that basis should be facilitated with developing students’ critical thinking skills in every department and discipline, ultimately creating institutionwide collaboration for promoting critical thinking.

Critical Thinking Across the Disciplines

It is a hallmark of modern colleges and universities that academia is specialized. While there is nothing intrinsically wrong with academic specialization, specialization can lead academic disciplines into academic “silos.” It excludes the possibilities of cross-discipline learning and dialogue. However, cross-discipline dialogue in colleges helps to foster an environment of faculty learning about what other faculty members are practicing. This ultimately benefits students since it exposes faculty to new ideas and innovative practices that seep into pedagogy for encouraging critical thinking. Moreover, community college faculty teach general education courses in addition to discipline-specific courses, making it almost a requirement that instructors remain intellectually flexible and interconnected between communities of general education and specialization.

We do, however, recognize that there are particular challenges to critical thinking that are endemic in each discipline. The following discussion outlines critical thinking challenges and solutions in our three disciplines. Though the assignments we suggest to develop students’ critical thinking skills vary, the competences underpinning all three are nearly identical. This correlation suggests that instructors of any discipline can adapt our presented solutions to their own assignment needs for developing critical thinking in students.

Philosophy

Philosophy is a rational examination of questions of enduring worth. One area of philosophical study is inquiry into the nature of reason and principles. Critical thinking, most broadly construed, is the study of reasons and principles undergirding good thinking. Hence, there is a conceptual connection between philosophy and critical thinking. Philosophers from ancient to modern times have recognized the fundamental importance of

questioning: Socrates famously said that the “unexamined life is not worth living,” and Kant said that the point of the Enlightenment was to “think for oneself.”

Most critical thinking instructors agree that the following topics should be covered in any critical thinking course:

- Logic, formal and informal. Logic consists of knowing some of the argument patterns and what it means for an argument to be valid or sound. It also covers patterns and types of fallacious reasoning.
- Argumentation. This teaches students what an argument is and what constitutes good argument. An argument in which claims do not relevantly connect to the conclusion is a bad argument.

As important as critical thinking is to philosophy, it presents unique teaching challenges. One challenge is the low level of students’ critical reading skills. While students are generally good at reading for content, they often have difficulty appreciating the structure of philosophical readings. One confusing structural feature is embedded dialogue—students frequently cannot distinguish whether an author is offering a personal position or the position of a critic. Unless students can fully appreciate what they are reading, though, it is nearly impossible for them to properly analyze a text. A similar challenge happens during argument analysis.

Assignment to Develop Critical Thinking

A good method to cultivate critical thinking skills in philosophy courses is a multi-prong argument analysis assignment. In this type of assignment, a reading is assigned, ranging in nature from a short newspaper editorial to a more complex philosophy essay. Students are asked to read the text carefully by themselves and then assemble into small groups to discuss the reading. After the small group discussions, a class discussion occurs. The final step for students is to complete the actual assignment individually. This requires them to locate the main issue and thesis statement of the text, identify the argument’s conclusion and its premises, and analyze the argument’s structure for soundness and validity. Assigning four or five argument analysis assignments in a 16-week semester enables instructors to track student improvement and progress.

It should be noted that the practices discussed in this section are course neutral; they can be applied to any philosophy course, including introduction to philosophy, ethics, social and political philosophy, or philosophy of religion courses.

Biology

Science and biology rely on experimental evidence to help us understand the natural world. Understanding experimental design, data presentations, and conclusions drawn from empirical tests is the foundation of a biology student who thinks critically. As such, successful critical thinking separates a good science student from a student who thinks science is all memorization.

While the content that biology courses rely on has been determined experimentally, there is not sufficient time to

explain the test design for every biological concept or finding we teach. Prodding students to innately begin asking “Why?” can help them learn and remember concepts. Discuss the methods of scientific investigation with students, have them analyze sample data for each key concept in a course, and create assignments where students collect, organize, present, and analyze data to offer them practical understanding. Any student can memorize that mitochondria power a cell, but if they remember that the data say mitochondria closely resemble free living bacteria and bacteria are good at turning sugar into energy, they are more likely to correctly conclude why mitochondrial diseases in newborns are so devastating. Another example of how asking “Why?” contributes to critical thinking: students who learn and can explain why a cell copies DNA to divide are far more likely to transfer this knowledge when critically examining other relevant biological processes.

Assignment to Develop Critical Thinking

Teaching scientific literacy skills is crucial to supporting critical thinking and the transfer of it into other areas of student scholarship. A project to accomplish this in the sciences is to ask students to choose a controversial topic within the discipline and compare and contrast a popular source (like a web page) with peer-reviewed literature on the same topic. Students should use several criteria to evaluate each publication, including author credentials, references, raw data presented, and the use of emotionally charged language. After some practice, most students will understand that peer-reviewed scientific literature is generally more dependable for information than popular sources. The skill of critical evaluation will also be useful in other areas of students’ research and studies.

Economics

Economics students must be equipped with critical thinking skills and abilities to analyze comprehensive data and information pertaining to complex social-political-economic systems. Critical thinking enables students to recognize and understand subjective aspects of variables and discern the difference between fact and opinion, also referred to as positive economics and normative economics. When a student uses critical thinking in their economic analyses, they are able to develop recommendations and policies that produce optimal outcomes for individual households, firms, industries, communities, countries, and the global economy. ritically examining other relevant biological processes.

Assignment to Develop Critical Thinking

Have students present on a current event they believe demonstrates at least three different economic concepts, theories, or models from class. Student must use at least three different sources to develop their presentation of the event, and must additionally present on the nature of each article and the relationship between the articles. More specifically, students should explain what type of source each article is, describe how the

different sources present the current event (including similarities and differences), indicate how the event applies to the current course topics, and identify how this event and its economic topics apply in their own lives.

Conclusion

It is important to teach students critical inquiry, or to ask “Why?”, in every discipline because encouraging this behavior works toward generating better overall critical thinking skills. A student trained and practiced in critical thinking is a better student, a better employee, and a better citizen. Ideas for critical thinking skills development are not limited to the suggestions in this essay: professors can craft unique in-class discussions, test questions, and writing assignments that promote critical thinking. Plan to provide increasingly challenging thinking obstacles as the semester proceeds to keep students’ minds expanding. The college and your students will benefit.

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