

# Moving Beyond the Buzzword: Teaching Students About Critical Thinking

In recent texts exploring critical thinking at the college level, some scholars have suggested that “critical thinking” is better approached and defined as a disciplinary outcome (Beyer et. al). This argument suggests that generic definitions of critical thinking ignore the weighty influence of context in forming pedagogical goals. Does attempting to articulate shared higher level thinking goals across disciplines continue to hold value? How do faculty from different disciplines at UW describe and infuse critical thinking into their courses?

Following in part from John Dewey’s “liberal learning” model of education, the critical thinking buzz gained widespread appeal in the 1980s, and by 1990 the term had rooted itself firmly in educational lingo. But, some researchers have questioned how effectively the concept and related skills are being taught at the college level. Richard Paul, president of the Center for Critical Thinking, writes that while most college professors believe they teach critical thinking, many have difficulty articulating what they mean by it or how they implement higher-level thinking within courses.

Patricia King and a group of colleagues in educational psychology at the University of Michigan have been conducting studies over the past twenty-five years to determine the degree to which college produces reflective judgment and higher order thinking skills in undergraduate students. On the bright side, these studies show that increases in critical thinking appear to be a direct result of attending college, and that college seniors do understand that a controversial problem can (and should) be approached from several different perspectives. However, when prompted to reach a reasoned conclusion, even when given all the necessary information, most cannot make this leap. King says, “When pressed to say, ‘what do you think about this? What suggestions would you make and what are they based on?’—that’s when the process falls apart.”

Pressure for individual disciplines within colleges to develop more systematic approaches and assessments for critical thinking is increasing, though, as state legislatures move toward greater accountability of learning outcomes. This assessment focus has led to more conversations about the nature of critical thinking in different disciplines, and whether the term really carries the same meaning across fields. If approaches and definitions vary widely, this discrepancy might explain why undergraduate students frequently have difficulty articulating definitions and goals for critical thinking (Miller).

In addition to core skills like synthesis and analysis, faculty panelists on the following pages 1) identify several specific goals for critical thinking at the undergraduate level and 2) provide an assignment excerpt that reflects these objectives. Some descriptions share common language, and others are framed more tightly within the language of the discipline. In their approaches, several faculty highlight the importance of real-world or “relevant” connections and application to learning, as well as prioritizing depth in learning over coverage.

## Resources

- Beyer, C. H., Gillmore, G. M., & Fisher, A. T. (2007). *Inside the undergraduate experience: The University of Washington's study of undergraduate learning*. Anker: Bolton.
- King, P. M. & Montgomery, J., & Moody, P.G. (2003). *Case studies for the first year: An odyssey into critical thinking and problem solving*. New Jersey: Prentice Hall.
- Miller, M. & Ewell, P. *Measuring Up on College-Level Learning* (2005). San Jose: National Center for Public Policy and Higher Education.

*When I was an undergraduate, critical thinking was not a term that was used as widely as it is now. Or if it was, it did not make out of pedagogy discussions and into the classroom. My experience as a student has led me to believe that one of the most effective assignments for critical thinking is asking a student to teach or lead a class discussion. This type of assignment requires a level of engaged thought that moves beyond synthesizing information for a paper. It requires a fluency in the topic and a meta-language to access the topic. Thinking about how to present information or lead a discussion requires critically evaluating both information and audience. The preparation also requires decisions about what is presented and what is excluded.*

*Tessa Kostelc, English graduate student*



## Robert Mayes

Director, Science and Math Teaching Center  
Professor, Secondary Education

One of my primary critical thinking goals is to help students experience and enjoy the cognitive dimension of learning math. Students often view math as a memorization endeavor—a series of finalized, encapsulated formulas devoid of connections or real-world implications. In this surface-level model, students don't understand how one formula or concept connects to or builds upon another. As students continue with their math courses, real learning is lost in a perceived stream of mechanical ideas and formulas. In focusing on deep learning rather than coverage, students also begin to see that math is actually a creative, sometimes messy process. Critical thinking involves struggling, shifting our perspectives to truly understand concepts like exponential growth. In my courses, inspiring critical thinking can also mean guiding students to uncover their own misunderstandings rather than simply telling them.

In teaching math, engagement is often the toughest component. Students wonder, "why should I care about this?" They need a context they can relate to: an event or phenomena that connects to their lives. Finding a local or global issue through which a teacher can model problem-solving helps students see the relevance of math. In the Japanese model of pedagogy, learning begins with the "big picture" and moves toward the smaller components or parts. In our approaches to science and math, we often focus on part-part-part long before the whole.

### SAMPLE ASSIGNMENT

*Excerpts from College Algebra Lab*

**Pollution.** The amount of pollution in the air goes up and down with the change in seasons. Heavy rains or wind in the spring lowers pollution, while in drier periods the pollution increases. However, the long-term trend for pollution is to increase. Data was collected on pollution in the air where time  $t$  is in years, with  $t = 0$  representing January 1, and  $p$  representing the amount of pollution in parts per million [10 points].

Time	0	0.25	0.5	0.75	1	1.25	1.5	1.75	2.00
Pollution	100	176.88	257.52	191.43	122.14	207.15	295.99	224.17	149.18

Use *Derive 6* to make a scatter plot of the data by using the **Author, Matrix command** and setting up a 9 row by 2 column matrix. Enter the data and plot it. Zoom-in on the data to an x-axis scale of 1 and a y-axis scale of 100. Count the number of turns in the data set and conjecture the smallest degree polynomial that could be used to model the data.



## **Erin Campbell-Stone**

*Associate Lecturer, Geology & Geophysics*

In science courses development of critical thinking skills allows students to progress from being sponges (absorbing information) into thinking like a scientist. A scientist must be able to make solid observations, draw conclusions from those observations, generate hypotheses, design appropriate tests of those hypotheses, and form interpretations that honor their data. A scientist must also evaluate others' interpretations by being skeptical but unbiased. Problems can arise when students confuse scientific skepticism with opinion; personal and public opinion are not equally as valid as scientific interpretation despite misrepresentation of this in the media. Teaching students to make fact-based judgments will help them make good decisions both in their personal lives and as members of society.

Exercises involving critical thinking can be incorporated into courses at any level. Despite limited experience with scientific content in introductory-level non-majors science courses, students can process information, devise problem-solving strategies, and identify additional data that would make their interpretations stronger. In upper level courses, it is imperative that students in the sciences are exposed to unresolved problems that require them to assess the validity of their interpretations within the limits of the data they have gathered.

### **SAMPLE ASSIGNMENT**

*Excerpt*

GEOL 1600 Global Sustainability is an "S" course that also fulfils the "G" requirement. The course focuses on international case studies of sustainability issues. The assignment below is an example of a laboratory assignment written by Jimm Myers and me examining the real-life problem of arsenic poisoning of groundwater in Bangladesh. The students were assigned an actual report written by hydrologists and spent the previous week creating a groundwater model. This assignment builds on the previous week's lab:

#### **South Asian Hydrologic Consultants: Bangladeshi Water Quality Assessment**

Some of the residents of these villages have become ill, and it is unknown which wells are contaminated and with what elements. Your task is to determine which wells are contaminated and what has contaminated them.

You will need to get chemical analyses from the surface water and the groundwater. Ideally you would sample every well and many locations on the river and test for every contaminant. Unfortunately you have been given a budget of only \$1300 (the average annual income of a Bangladesh resident). It costs \$10 to collect a sample and \$40 per element for an analysis.

Use your geologic and hydrologic models to determine where to collect water samples and for what elements. Record your samples in the report on the next page. Don't exceed your budget!

On the attached maps, record the chemical data for each well at each location. Use your knowledge of groundwater flow, stream flow direction, and characteristics of losing streams to determine which wells are contaminated and by what. You may want to contour your maps for contamination. Fill out the report on the next page with your results.



## Rodney Garnett

Professor, Music

As musicians, we spend a lot of time imitating others and interpreting written music. Like athletes, the mindset is often, "just keep practicing; don't fall behind!" For music majors, much of the early coursework and practice is largely skills-based. But, in music, part of the critical thinking so important to growth centers around developing a musical personality, or being able to consolidate very different musical sources and create original material. In addition, critical thinking in music highlights appreciating marginalized perspectives, being exposed to diversity in music outside the established canon, bringing together or synthesizing ideas, and being able to evaluate the educational process students are experiencing to determine where the gaps might exist. For music education majors, one of the most key elements of critical thinking is the ability to locate sources of information when they get out into a school setting where they may be the only music teacher, to be able to interact with and interpret music on their own.

For freshmen, I create my own compilations of music for them to practice "ear training;" students need to hear multiple musical sounds from around the world beyond the western European and American classical realm. Various guests come to class to widen students' perspectives of what music can be. In the World Musics classes at the sophomore/junior level, I want students to think deeply about what music means to people and to life in other places. Students need to develop self-awareness of what influences our reactions to music and how those preferences impact our identities and lives.

### SAMPLE ASSIGNMENT

*Focused autobiography exercise (first-year students)*

On this sheet of paper represent yourself with a circle in the middle.

Think back to when you were between about the ages of 10 and 14. What music did hear?

School, Home, Family time – in the car, at church, in the street, public places like supermarkets or shopping malls, etc. Connect these circles to yourself and to other pieces in the web. What forces affected music making in your life? How did they relate to each other? What affected your likes and dislikes? Were you able to have an effect on the adult world through music?

*Excerpt from The "Music I Don't Like" Project! (sophomores, juniors)*

- Think of a particular type of music which you do not like or which you do not find interesting.
- Reflect - Begin your paper with a reflective paragraph about why you do not like this music or the culture surrounding it.
- Attend - If possible you should attend an event featuring this type of music. This could be a concert or informal performance, rehearsal or simply a playing session.
- Interact – Interact with someone who makes this music. Find out as much as possible about what the music means to them.

Here are some suggestions for topics to address in your paper.

Setting (what are the impacts of setting on the performance and performers?), People (who are the musicians, what are their backgrounds?), Soundscape (what are the instruments, voices, and sounds in the room?)



## Mary Sheridan-Rabideau

Director, English Composition  
Associate Professor, English

"Critical" is a buzz word bandied about so often that it's hard to know what critical even means. To me, when academics use critical they mean being aware of how ideas, texts, or practices are constructed and being able to use that awareness to construct ideas, texts and practices of our own.

In my classes, I help students achieve this critical ability by asking them to develop both **fluency** with concepts and/or practices and a **meta-level awareness** of how this fluency works. For example, in The Rhetoric of Activism course I'll teach this spring, we'll spend the first part of the class becoming theoretically grounded in a particular method for studying language called discourse analysis. We'll then use this lens to analyze representations of contemporary activism in newspaper reports, grant proposals, foundation documents, and white papers for activist strategies (meta-analysis). Finally, in individualized and group projects, we'll apply the characteristics of activist rhetoric we've recently articulated in our own writing (fluency).

The two major assignments for this class illustrate how fluency and meta-awareness relate to critical thinking and writing skills. The first paper prompts students to develop fluency with discourse analysis by asking them to critically examine *how* an activist text works. The second paper asks students to: 1. apply those textual strategies to something they compose for a public audience; and, 2. write a meta reflection that uses discourse analysis to explain how their text accomplishes its task.

### SAMPLE ASSIGNMENT

#### *Excerpt from Paper 2 Assignment*

The goal of this second paper is to write an effective text that moves people to act. To see how your words do this, Paper 2 will be a public text. Although I will need to approve your topic, it is likely that any topic related to activism will do. Some ideas include:

- A grant proposal (e.g., to a funding source for a community organization)
- A newspaper article or zine (e.g., about a general topic like the environment or single sex education or about a specific debate, such as UW's Land Use policies)
- A webpage (e.g., for a teen parenting co-op or a UW RSO)
- A set of documents for an activist organization (e.g. Habitat for Humanity)

This assignment has many stages:

- An initial one-page, single-spaced proposal that outlines your project idea, the need for this document, and the projected audience.
- An oral presentation (10 minutes for individuals/longer for groups) describing your project in more detail.
- A final project consisting of a public document that attempts to make something happen and a 1-page analysis of how you rhetorically accomplish your goal.

If you are uncomfortable with creating a public document, you have can write 15 page paper similar to the midterm. See me and we can work something out.



## Gracie Lawson-Borders

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Associate Professor, Communication and Journalism

Media are ubiquitous in our society. Everywhere you look there are newspapers, television, radio, films, advertisements, billboards, cell phones, ring tones and text messaging. The Race, Ethnicity, Gender in the Media course provides an overview on issues of representation for race, gender and ethnicity in contemporary media, specifically popular culture such as television shows, reality TV, advertisements, music videos and films. The class uses multimedia delivery to examine media artifacts. The media in society challenge our ideas, attitudes and belief systems. Students are encouraged to critically think about the role of media in society to critically analyze text, images and sounds.

The assignment described below is designed to push students in their analyses to go beyond the surface to interpret the images, sounds, and text they encounter for a deeper analysis. Using a critical lens, the assignment's goals are: (a) to challenge students' comfort zones when interacting with media; (b) to collect, analyze and evaluate media artifacts; and (c.) to follow sound reasoning to reach logical conclusions.

### SAMPLE ASSIGNMENT

*TV Gender Analysis Assignment (synopsis): Race, Ethnicity, Gender in the Media*

1. Watch 3 hours of prime-time TV programming (e.g., regular weekly programs—not daily news coverage, *20/20*, *Dateline*, *48 Hours*, movies, sports, etc.)
2. Look for evidence of the reinforcement of or challenge to gender stereotypes in television characters.
3. *Quantity of representation:* track overall numbers of characters in terms of gender. Calculate the percentages for each group from your total figures. How might these compare with the actual proportion of people in U.S. society who belong to those gender groups? U.S. Census Bureau website is a good resource.
4. *Quality of representation:* notice how women and men are portrayed. Take note of how racial, ethnic or sexual orientation is portrayed by characters.
  1. What kind of roles and characters do they play?
  2. What are the relations of power and authority?
  3. Does one group tend to play heroes, or villains?
  4. What kinds of occupations do the different groups have?
  5. Who are the major characters, and who are the bit players?
  6. Who is excluded from representation?
  7. Does casting have any relation to gender, race, ethnicity or sexual orientation?