Getting Specific about Critical Thinking: Implications for Writing Across the Curriculum

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Introduction

The development of students' critical thinking abilities has long been an omnipresent concept in composition theory, in writing pedagogy, and, indeed, in many of our writing classrooms. Perhaps some readers have even listed critical thinking as a learning outcome on one of your course syllabi? As a writing across the curriculum (WAC) director and composition instructor at my own institution, I've found that the phrase "critical thinking" has a great deal of import across the curriculum, more so than other phrases I've tried to share with faculty teaching writing across the curriculum—phrases like *genre awareness*, *knowledge transfer*, or even . . . *rhetoric*.

Recent articles in *The WAC Journal* have noted critical thinking as a liberal learning concept that is at work activating the key features of threshold concepts (Basgier, 2016); and as an outcome of the revision process (Bryant, Lape, & Schaeffer, 2014). Other landmark works in WAC draw deliberate connections between critical thinking and faculty workshops (Fulwiler, 1981); the sequencing of composition courses (Beaufort, 2008); and the integration of critical thinking with disciplinary writing assignments (Bean, 2011). We might take as further evidence of critical thinking's omnipresence in composition pedagogy its appearance in the 2014 Council of Writing Program Administrators (WPA) "Outcomes Statement for First-Year Composition" as well as within CCCC's own 2015 position statement, "Principles for the Postsecondary Teaching of Writing." In fact—writing aside—faculty, staff, *and* administrators in higher education might be hard-pressed to find a concept more widely shared and agreed upon across the curriculum than the expectation that students should develop *critical* and analytical thinking skills during their pursuit of a higher education.

Yet, despite the prominence of critical thinking in composition courses and higher education curricula, a widely shared and agreed upon definition of this term proves elusive, which complicates its import into WAC conversations. The present study builds from existing scholarship on critical thinking and language in an attempt to delineate a clear and nuanced view of critical thinking in the context of writing across the curriculum.

DOI: 10.37514/WAC-J.2018.29.1.06

The lack of a widely agreed upon definition of critical thinking in academic discourse isn't for lack of trying. Forty-six critical thinking experts once assembled (in 1990) on behalf of the American Philosophical Association to develop what became known as the *Delphi Report* (Facione). Since that 111-page report in 1990, the Association of American Colleges & Universities (AAC&U) has made serious contributions toward articulating critical thinking, which their "VALUE" rubric defines as "a habit of mind characterized by the comprehensive exploration of issues, ideas, artifacts, and events before accepting or formulating an opinion or conclusion." While this definition helps universities move toward a universally agreed upon definition of critical thinking, the AAC&U's definition evades complicated disciplinary questions through the generous interpretability of what constitutes "comprehensive exploration," or what indicates whether a student's "habit of mind" has achieved a critical character. Those readers who study writing in the disciplines, undoubtedly read this AAC&U definition and begin to ask: does comprehensive exploration look different in history than it does in communication studies or physics?

We might expect definitions from organizations like the AAC&U to be intentionally vague so as to apply to many diverse academic disciplines and programs, but our own composition research also ubiquitously generalizes what it means to "think critically" and to utilize that thinking in writing processes. The 2014 iteration of the *WPA* "Outcomes Statement for First-Year Composition" provides the following definition:

> *Critical thinking* is the ability to analyze, synthesize, interpret, and evaluate ideas, information, situations, and texts. When writers think critically about the materials they use—whether print texts, photographs, data sets, videos, or other materials—they separate assertion from evidence, evaluate sources and evidence, recognize and evaluate underlying assumptions, read across texts for connections and patterns, identify and evaluate chains of reasoning, and compose appropriately qualified and developed claims and generalizations. These practices are foundational for advanced academic writing.

This definition offers more specificity than the AAC&U's definition in that particular "habits of mind" are understood to be analytic habits, synthetic habits, interpretive habits, and evaluative habits, and to be "comprehensive" is more specifically to "separate assertion from evidence, evaluate sources and evidence, recognize and evaluate underlying assumptions, read…for connections and patterns" etc. As worded, it's clear that these specific habits and traits of comprehensiveness are indeed "foundational for advanced academic writing"; but, when synthesized, these habits and traits also amount to tasks that look a lot like something very specific—*rhetorical analysis* of text. But is this the kind of critical-thinking-through-writing my social work students in first-year-writing courses will need most? Considering first-year writing's unique

role of educating all incoming students and in preparing all students to think critically through academic writing, it's worth asking whether rhetorical analyses of "printed texts . . . or other materials" prepare students for the habits and traits expected of them in other coursework. This is not to say that close rhetorical reading of text is not a valuable skill for all students to learn; rather, in the same way that Howard Tinberg explains that "metacognition is not cognition" (*Naming What we Know*, 75), we might come to see that generally valuable academic thinking skills are not the same as skills for thinking critically in one's discipline.

Principle eight of CCCC's 2015 "Principles for the Postsecondary Teaching of Writing" reads: "Sound writing instruction supports learning, engagement, and critical thinking in courses across the curriculum" and provides the following explanation:

> Instructors emphasize that writing development is continuous and supports learning, engagement, and critical thinking by using activities and assignments to help students learn and engage with information, ideas, and arguments within specific courses. Beyond specific writing courses, instructors emphasize this purpose when they create opportunities for students to recognize expectations for writing within their disciplines and use writing to help them prepare to participate in their intended disciplines. Institutions and programs emphasize this purpose by providing faculty in other disciplines opportunities to learn about and incorporate writing strategies in their pedagogy.

Here, we see that an instructor's emphasis on writing development is "continuous" and supports critical thinking through "activities and assignments" that "help students learn and engage with information, ideas, and arguments within specific courses." The lack of specificity here might lead some to conclude that if instructors just continue assigning writing, students will begin engaging with discipline-specific information, ideas, and arguments critically; that all assignments and activities that are continuously developing writing are simultaneously teaching students to critically engage with the thinking and content required by specific courses. CCCC's explanation provides more specificity by asserting a principle that instructors should "create opportunities for students to recognize expectations for writing within their disciplines and use writing to help them prepare to participate in their intended disciplines." As with the 2014 *WPA* "Outcomes Statement for First-Year Composition", we see the CCCC's explanation of critical thinking narrow to the point of prescribing something very specific; in this case, what we might see as disciplinary discourse analysis and/or genre awareness, which is aspirational content in first-year writing.

The definitions provided by the AAC&U, CWPA, and CCCC statements are all useful steps toward an explicit understanding of what it means to think critically and

the role of writing in the work of critical thinking habits of mind. Yet, these statements on critical thinking also take on a character that is at once vaguely general—*critical thinking is a habit of mind*—and then explicitly narrow in first-year composition—*critical thinking is rhetorical analysis; critical thinking is genre awareness*. What emerges in the space left between these two positions is a debate as to whether critical thinking is a general skill (a view associated with Robert Ennis's 1987 work), a variety of discipline-specific skills (associated with John McPeck in 1990), or an array of general skills that can be privileged in different orientations by different disciplines.

A More Nuanced Definition of Critical Thinking

Tim John Moore's 2011 study *Critical Thinking and Language* is the most recent and comprehensive examination of opposing disciplinary distinctions for critical thinking as a learning objective in higher education. Conducted over the course of one year (2005 to 2006), Moore utilizes spoken data—from seventeen in-person interviews—and textual data (i.e. teaching documents collected from participants) to parse out disciplinary meanings of critical thinking in history, philosophy, and literary/cultural studies. Moore concludes that all disciplines in his study loosely understand critical thinking as "an extra edge of consciousness" (234) while seven distinct "dimensions of difference" in critical thinking emerged among interview participants. Though only a single study, such distinctions offer profound implications for higher education pedagogy, especially for teachers, scholars, and administrators of WAC programs.

One potential use of a more nuanced definition of critical thinking for WAC teacher-scholars is that critical thinking can become a neutral ground for starting conversations across campus about what writing moves are valued by different disciplines. Since writing is required for advanced thinking, conversations about writing in the disciplines can begin with conversations about what kind of critical thinking is important in a particular discipline/course. Once faculty (in workshops or conversations with a WAC director) determine the kind of critical thinking they value from students (e.g., awareness of subjectivity), those faculty can begin to discuss how those expectations become imbedded in writing conventions (e.g., the use of first person). As WAC scholars begin to talk about critical thinking in more specific terms, fruitful conversations about how expectations for student writing are embedded in expectations for student thinking can begin to take place.

Another benefit of a more nuanced definition of critical thinking for WAC teacher-scholars is that as faculty and WAC directors get specific about the kind of critical thinking a course is seeking from students, informal and writing-to-learn assignments can be discussed as important tools for helping students practice the kind of thinking their instructors want to encourage in their writing. For example, if a professor speaks with a WAC director about the importance of objectivity as a form

of critical thinking, then writing-to-learn assignments that help students revise away subjective language can be employed in that classroom. In cases such as this, conversations about specific uses of critical thinking can become the backdrop for planning informal and writing-to-learn assignments.

Finally, a more nuanced definition of critical thinking for WAC teacher-scholars can help propel conversations about discipline-specific writing conventions, traditionally unearthed by content and disciplinary discourse analyses in WID scholarship. Examination of disciplinary privileges for specific modes of critical thinking offers a new lens for understanding disciplinary writing conventions. Is there a particular kind of critical thinking that history students are being asked to hone as they mature in their academic programs? And if so, what kind of disciplinary writing assignments promote such thinking? Would rhetorical analysis and genre awareness approaches in first-year writing courses sufficiently prepare students for the kind of thinking expected of them in history courses? If there are specific arrays of critical thinking skills that different disciplines privilege, could programs be creating composition-learning communities of students from disciplines not typically associated with one another (say history and physics) based on the kind of critical thinking privileged by their disciplines?

Such questions could be a fruitful line of inquiry for composition research were the field to explore disciplinary perspectives on critical thinking in more detail. The present article aims to contribute toward this detail by furthering Moore's 2011 investigation of critical thinking in a way that has been framed for composition and writing researchers.

Moore's study offers important implications for university curricula, writing instruction, and for better understanding the disciplinary nuances in conceptualizing *critical thinking* as a learning outcome, but the study is not without critique. Martin Davies' 2013 article "Critical Thinking and the Disciplines Reconsidered" takes Moore to task for what Davies describes as a "relativist attitude" that is "dangerous and wrong-headed" in its "specifist approach" (15). A key concern for Davies is that Moore constructs a false dilemma that critical thinking is either a "universal category" that would apply to all disciplines, or a "catch all" concept and therefore really only has a plurality of discipline-specific meanings when examined more closely (6). In partial agreement with Davies' contention, this study explores a third position: that there may be discipline-specific privileges for particular critical-thinking skills, but these skills remain general critical-thinking skills available and valuable to all.

There are other key ways to build on Moore's study. First, the disciplines studied by Moore—history, philosophy, and literary/cultural studies—are all traditionally understood as humanities disciplines. Would the loose understanding of critical thinking as "an extra edge of consciousness" with the seven distinct "dimensions of

difference" revealed by Moore hold true if we extend such questions to disciplines in natural science, social science, business, and art? Secondly, his study takes place at an urban research institution in Australia. Are these disciplinary distinctions for critical thinking present at a public university in the US? Thirdly, does the low sample size of Moore's study (n=17) offer the possibility that he captured an anomaly or institutional group-think that may not hold true among a larger population of participants? With an eye toward writing research and these critiques of Moore's study in mind, the present study explores critical thinking across the curriculum at a large public university in the Mid-Atlantic United States with more than double the participants of Moore's and with a much more diverse representation of academic disciplines.

Study Methodology

Participants

This study involved 45–60 minute individual interviews with thirty-seven faculty members, as stated, at a large public university in the Mid-Atlantic United States. Faculty were selected at random by a research assistant who invited participants via university email. Invitations were made with an explicit goal to achieve diverse representations across five of the university's six academic Colleges. This resulted in interviews with the following faculty:

- Accounting (1)
- Anthropology (1)
- Athletic training (1)
- Biology (1)
- Chemistry (1)
- Communication sciences & disorders (2)
- Communication studies (2)
- Counselor education (1)
- Criminal justice (1)
- Early & middle grades education (1)
- Economics (1)
- English (2)
- Geography & planning (1)
- Health (1)
- History (1)
- Human resources (1)
- Kinesiology (1)
- Literacy (1)

- Management (3)
- Marketing (1)
- Music (1)
- Philosophy (1)
- Physics (3)
- Psychology (1)
- Public health (1)
- Social work (2)
- Special education (2)
- Women's & gender studies (1)

The greatest number of interviews were held with faculty in the College of Business and Public Management (9), followed by the College of Arts and Humanities (8). The College of Sciences and Mathematics (7) and the College of Education and Social Work (7) had equal participation, while the College of Health Sciences (6) had the least participation among faculty. All interview participants signed written consent forms prior to participation.

Data Collection

This study collected three types of data for analysis: interviews recorded through a typed transcript, assignment sheets and descriptions from faculty, and faculty suggestions of works (articles, books, film, etc.) that each participant saw as exemplifying critical thought in their discipline. The typed transcript was produced by a research assistant who attended all in-person interviews. To ensure proper meaning was understood, a short-hand transcript was also taken by the interviewer and could be used to clarify meaning in the written transcripts. Interviewees agreed to provide any follow-up clarification if needed following the interviews.

There were an estimated thirty-two hours of interview data collected among the thirty-seven participants. Thirty-two of these interviews took place in the offices of participants, three interviews were held over the phone, and two interviews took place in the office of the lead researcher. The interviews were organized around ten questions asked of participants after they had consented to participation and transcription of their responses. The questions asked of participants are based on questions outlined in Moore's study of critical thinking with some variation. Those questions are as follows:

1. How would you define your discipline, and what kind of thinking and inquiry it emphasizes?
2. Is being critical valued in your discipline?
3. When, if ever, does your discipline use the term "critical"?

4. What does it mean to be "critical" in your discipline?
5. Can you point us to a strong example of a critical work in your field?
6. How do you define "critical thinking"?
7. How do you teach critical thinking in your discipline?
8. Do you see this kind of critical thinking as general or specific/unique to your discipline?
9. Which assignments in your courses require the greatest deal of critical thinking?
10. Would you be willing to share some assignments, readings, etc. that you think are examples of critical work in your discipline?

Deviation from this question list occurred at times in order to clarify questions for participants or to follow-up on interesting answers that could be further articulated in the transcript. For example, some faculty didn't have a clear sense of how to answer question one (How would you define your discipline and what kind of thinking and inquiry it emphasizes?). In these situations, I would ask: "Is there maybe a grand question your discipline is ultimately exploring or trying to address?"

Additionally, after asking question five (Can you point us to a strong example of a critical work in your field?) I recapitulated participant answers for participants so I could be sure I had a full understanding of their sense of what it means to be critical in their discipline before moving on to questions about critical thinking itself (questions six through ten). Question seven (How/do you teach critical thinking in your discipline?) often led to multiple assignment descriptions from interviewees, in which case I often honed in on ways that writing is used to think critically or to capture critical thought.

There were fifteen participants, or 40.5% of interviewees, that provided assignment sheets and descriptions of assignments that highlight critical thinking in respective disciplines. There were twenty-three participants, or 62% of interviewees, who were able to point toward an "exemplary work" of critical thinking during the interview. In Moore's study, this data took the form of collecting discipline-specific study guides, but no such culture of study guides existed at this specific university. Instead, faculty were asked what they would point students toward as demonstrating strong critical thinking in the discipline.

Data Analysis

The thirty-seven transcripts of faculty interviews and supplemental documents (assignment sheets and readings when provided) were uploaded and stored in a cloud-based file management system where they were placed in individual folders labeled based on disciplinary identification (e.g. Social Work 2). The transcripts were then analyzed in two separate phases: the first phase analyzed participant transcripts

and any available supplemental documents on individual terms, and the second phase analyzed patterns across participant transcripts.

The first phase of this analysis consisted of a process that began by rereading the entire transcript and drafting an approximately 100-word summary of how the interviewee conceptualized critical thinking in the interview. This summary helped condense interviewee responses into a manageable unit of analysis. Summaries took note of what the interviewee sees as the goal, or epistemological function, of the discipline, and what kind of critical thinking is needed to perform well within that disciplinary epistemology. Here is an example summary derived from an analysis of data from an anthropology interview:

> For this [anthropology] interviewee, part of thinking critically is making sure what you're doing is always situated in response to a larger (social?) issue. The goal of anthropology is to "shed light on how different people in different contexts confront those (death, suffering, betrayal, love, hate) issues." Critical thinking is about seeing relationships among things that you at first don't see or recognize. This comes from moving between the micro and the macro which requires accepting complexity and making connections between things that seem disconnected (Anthropology 1).

Next, summaries were analyzed with attention to which "dimensions of difference" in critical thinking, identified by Moore, were indicated by interviewees as essential to critical thinking in the interviewee's academic discipline. Transcripts were reread for direct and indirect indications that a particular dimension of critical thought was privileged by the academic discipline. Those dimensions of difference exist as pairs on spectrums (see Table 1).

Table 1

Dimensions of Difference Definitions

Text-internal critical thinking (object-oriented) Texts are the principal object of inquiry in the work of critical thought.	**Text-external critical thinking (object-oriented)** Texts are a basis for critical thinking about an external "real-world" object.
Objectivist critical thinking (object-oriented) An objective meaning and understanding of an object can be derived if approached critically.	**Subjectivist critical thinking (object-oriented)** Meanings and understandings of objects are always influenced by the interpreter, and we must be critically aware of how our realities inform understanding.

Heuristic critical thinking (process-oriented) The process or procedure for being critical is stipulated or outlined in advance.	**Hermeneutic critical thinking (process-oriented)** The process of being critical is left open and processes are informed by the object/material being considered.
Theory-implicit critical thinking A prevailing (doxic) theory (such as empiricism) is *implied* in the doing of critical work, not made explicit.	**Theory-explicit critical thinking** A defined theory is made *explicit* as a framework for doing critical work (such as a Marxist critique).
Evaluative critical thinking (object-oriented) Critical thought is used to make a *judgment* about the *value* of material or an object.	**Interpretive critical thinking (object-oriented)** Critical thought is used to make *commentary* about the *nature* of material or an object.
Epistemic critical thinking Critical thought is oriented toward *reflection* on the truth or falsity of a claim about the object (is it true that…?)	**Deontic critical thinking** Critical thought is oriented toward possible *actions* to be taken in regard to an object (what should be done in this case…?)
Neutralist critical thinking Critical thought is directed toward pure understanding without ulterior motive.	**Activist critical thinking** Critical thought is directed toward an ultimate or ulterior goal of social or environmental change.

In the majority of transcripts, interviewees described critical thinking in their academic discipline in a way that would privilege one dimension of a pairing over another (e.g., would privilege text-external critical thinking over text-internal critical thinking). In some cases, however, neither dimension was evident in a given dimension pairing and therefore neither was noted. In other cases, both dimensions in a given pairing were given emphasis, and in these cases, both dimensions were noted (e.g., some interviewees emphasized both objectivist critical thinking *and* subjectivist critical thinking as essential).

The term *privilege* was adopted in this analysis to address Davies' critique of Moore that discipline-specific emphasis on a dimension does not *reject* a view of critical thinking as generalized, nor *affirm* a view of critical thinking as specialized. The presumption in the present study is that all academic disciplines value all dimensions of critical thinking in one way or another, but that different academic disciplines may lean more heavily toward certain dimensions; for example, literature may privilege text-internal thinking, but still value critical thought that applies a text to a concept outside of the text (text-external).

Once dimensions had been noted, the responses to question eight were examined in the transcript, and a determination was made as to whether the interviewee saw the kind of critical thinking sought from students as a *general thinking skill* or as a

skill *specific* to the interviewee's academic discipline. This question was added to the interview protocol to further address Davies' critiques of Moore.

A next step of analysis was noting from the interview transcript the method through which the interviewee attempts to teach students to think critically; this included the reading of supplemental documents such as assignment sheets (when provided) to generate further understanding of the interviewee's perspective on critical thinking. Data for this step of analysis stemmed from questions seven and nine. Question seven (How do you teach critical thinking in your discipline?) captured process-related assignments that faculty used to try and generate a particular way of thinking, including formal writings and informal in-class exercises. Question nine (Which assignments in your courses require the greatest deal of critical thinking?) captured product-related assignments that faculty used to test whether students were thinking critically or not. Assignment sheets (when supplied) were analyzed to validate or challenge the conclusions of interview transcript analysis, not as a form of evidence detached from its user/designer. For example, here's an example of a 100-word transcript summary from an interviewee with an instructor of counselor education:

> For this [counselor education] interviewee critical thinking requires [counseling students] bringing in as much information as [they] can in order to have a broad enough perspective to reflect on it. Much information has to do with the self; being reflective about who [the student is] as a counselor, including as a person, as a practitioner, and [reflecting on their personal] ethics and values. [Counselors] must continue to analyze [themselves] so as not to be a different person than practitioner—the two must align toward a genuine self (from Psychology). [This interviewee explains that] critical thinking is a "higher level thinking" that involves analysis and synthesis through reflection so you can know your own weaknesses and strengths, biases and judgments, why are judgments being made, what are my triggers[?] This is so integral that a debate in the discipline is whether counselors should recuse themselves from counseling those with different value systems. To be critical is to be aware of all of this as you engage in counseling. Ultimately you become a critical thinker when you can be intentional about the questions you ask because you see the broad perspective (Counselor Education 1).

This interviewee provided a supplemental assignment sheet for a "Case Analysis" assignment. In this example, the assignment sheet was analyzed with respect to the interviewee's view of critical thinking as described in the transcript, particularly the interviewee's sentiment that critical thinking is a matter of being "aware" and able to "reflect" in the work of counseling others. The assignment sheet (Figure 1) validates this view of critical thinking in the assessment rubric for the "Case Analysis"

as indicated by the highlighted language. In cases where supplemental assignment sheets challenged or refuted an interviewee's account of critical thinking, such language was highlighted in red (though no such observations were made). In total, fifteen participants (40.5%), provided supplemental assignment sheets during or after their interview for analysis.

Name _____ **Points**_____

EDC 576 Case Analysis Evaluation Rubric

Successful completion of the assignment indicates mastery of: Objectives: 1, 2, 3, 4, 5, and CACREP SLOs A.3, E.3, I.3, M.3; and PDE SLOs I.C.7, IV.A.5.

Evaluation Item	Met	Not Met
Demographics are included		
Shows thoroughness and sophistication when discussing influencing factors and interventions, including teacher/consultee characteristics, student/client characteristics and environmental characteristics		
Includes other data, such as observations, as appropriate		
Analysis and hypotheses are evident		
Mode of consultation and rationale is included		
Student creates interventions that reflect and are sensitive to unique system factors		
Student creates interventions that are sensitive to unique consultee characteristics		
Student develops interventions using the appropriate sources		
Student includes the family in the intervention to the degree that is appropriate		
Student identifies unique consultant-consultee variables that can facilitate or inhibit the creation of a collaborative relationship and indicates consultation mode most appropriate		
Student gives a self-reflection showing understanding and application of how this project impacts counselor identity.		
Student presents an organized paper, which includes all required information and is free of spelling and grammatical errors.		
Includes at least 5 citations in the body of the paper and paper is written in APA style		

Figure 1. Excerpt of Counselor Education 1 Supplemental Assignment (highlights added)

A third piece of information informing the analysis of interview transcripts was the analysis of any works (text, film, model) that interviewees pointed to as exemplary critical thinking in their academic discipline or field. A total of twenty-three faculty (62%) offered what they saw to be an example of strong critical thinking, but among those twenty-three faculty only ten participants, or 27% of interviewees, pointed to a specific textual example (author and title of a work) that could be analyzed (see Table 2). In these cases, works were accessed and surveyed to see how/if the interviewees' views of critical thinking were revealed in the exemplary texts. Other participants pointed to exemplary works that could not be analyzed for a variety of reasons: some interviewees said they "modeled" this kind of thinking to the class; others pointed to general theorists but no specific works. Further, others pointed to general types

of texts, like "research articles with a linear train of thought" (Physics 3), and others could not think of exemplary models of critical thinking at all. Moore's study relied on "subject outlines" used by professors to show students what they are "expected to adopt in the subject" (57). "Subject outlines" as described by Moore resemble "subject guides" in a North American context, but as far as was made evident, only one interview participant's department had developed such a document.

Table 2.

List of Faculty Participants Supplementing Interview with Exemplary Document

Interview Name	**Is this view of critical thinking validated by exemplary text, example?**	**Included in Analysis?**
Biology	Darwin	No
Communication Disorders 2	Yes, author's own textbook	Yes
Economics	Samuelson, Paul Anthony. Foundations of Economic Analysis." (1983).	Yes
Education	Robert Marzano's educational theories.	No
English 2	Bernstein, Robin. *Racial innocence: Performing American childhood and race from slavery to civil rights*. nyu Press, 2011.	Yes
Geography 1	Massey, Douglas S., and Nancy A. Denton. *American apartheid: Segregation and the making of the underclass*. Harvard University Press, 1993.	Yes
Health 1	Hacking, Ian. Rewriting the soul: Multiple personality and the sciences of memory. Princeton University Press, 1998.	Yes
History 1	Ammon, Francesca Russello. *Bulldozer: Demolition and Clearance of the Postwar Landscape*. Yale University Press, 2016.	Yes
Kinesiology 1	Professor acts as a role model interpreting cases to demonstrate critical thinking.	No
Literacy 1	Michael Pressley's work on Reading Comprehension	No

Interview Name	Is this view of critical thinking validated by exemplary text, example?	Included in Analysis?
Management 1	Trevino, Linda K., and Katherine A. Nelson. *Managing business ethics: Straight talk about how to do it right.* John Wiley & Sons, 2016.	Yes
Management 2	Good companies are managed critically, such as Netflix and Underarmour	No
Management 3	Validated by venture capital rounds modeled after "Shark Tank"	No
Management 4	Case studies	No
Music 1	Performances of work in the baroque era must have very specific embellishments.	No
Physics 2	Examples of good and bad science; Newton, Einstein, Climate Change	No
Physics 3	Any research article in physics that shows a linear train of thought.	No
Public Health 1	Validated by case studies.	No
Social Work 1	Tatum, Beverly Daniel. *Why are all the Black kids sitting together in the cafeteria?: And other conversations about race*. Basic Books, 2017.	Yes
Social Work 2	O'Connor, Alice. *Poverty knowledge: Social science, social policy, and the poor in twentieth-century US history*. Princeton University Press, 2009.	Yes
Special Education 1	Guest presenters and the professor's own modeling of critical reflection	No
Special Education 2	By videos and teachers own modeling	No
Women's and Gender Studies	Crenshaw, Kimberlé. "Mapping the Margins: Intersectionality, Identity Politics, and Violence against Women of Color." *Stanford Law Review*, vol. 43, no. 6, 1991, pp. 1241–1299.	Yes

A second phase of analysis was the identification of noteworthy patterns, hereafter referred to as "critical thinking dimensional strains" that emerged (e.g., a

text- external/objectivist/hermeneutic/theory-implicit/interpretive/epistemic/neutralist dimensional strain). While a pure view of academic disciplines would expect certain disciplines to be clearly aligned with similar sets of dimensions (e.g., expect sciences to be mostly objectivist, heuristic, theory-implicit, epistemic, and neutralist), these neat categories did not bear out in interviews, as will be discussed in the results section of this study. Instead, analysis revealed what this study labels "dimensional strains" that exist among disciplines not typically associated in pure views of academic disciplines. Patterns that appeared at least three times across different disciplines were labeled as "significant dimensional strains" in this analysis, while scenarios with at least two pattern appearances were noted for discussion and further investigation. An example of a dimensional strain would be multiple academic disciplines valuing the critical thinking dimensions that are text-external, subjectivist, hermeneutic, theory-explicit, interpretive, deontic, and activist.

A third and final step in the second phase of analysis was the identification of academic disciplines that were coded in the first phase of analysis as emphasizing both ends of a paired critical thinking dimension (e.g., disciplines that describe *both* text-internal critical thinking and text-external critical thinking). This information was analyzed because dual dimension use may imply greater critical-thinking complexity for these disciplines, and hence a pedagogical challenge narrowing the expected critical thinking skills for students studying in that academic discipline and the expectations for writing in those disciplines.

Results

The General vs. Specific Debate in Critical Thinking

As discussed earlier, Davies' key critique of Moore is that he constructs a false dilemma that critical thinking is either a "universal category" that would apply to all disciplines, or a "catch all" concept and therefore really only has a plurality of discipline-specific meanings when examined more closely (6). As a result, this study explored a third position, that there may be discipline-specific emphasis on particular critical-thinking skills, but these skills remain general critical-thinking skills available and valuable to all disciplines. This study explicitly asked participants whether the critical thinking skills they valued from students were general skills or skills specific to their discipline. Of the critical-thinking skills they were describing, 73% (n=27) of participants viewed them as general skills, 21.6% (n=8) of participants viewed them as specific or unique to their academic discipline, while 5.4% (n=2) could not definitively answer or considered it might be both. In sum, while many different critical thinking skills were privileged by faculty and competing definitions were offered, the vast majority (73%) maintained the critical-thinking skills they described as universal or general skills not

specific to their own academic discipline. This suggests that while faculty may privilege certain critical-thinking dimensions in their academic discipline, they maintain a view of these dimensions as general critical-thinking skills.

Dimensions of Critical Thinking Emphasized by Interviewees

As detailed previously (Table 1), Moore identifies seven "dimensions of difference in critical thinking beliefs and practices" (212). Table 3 shows data relating to dimensions of difference privileged by different disciplines, including the frequency with which a given critical thinking dimension was privileged among all thirty-seven interviews, as well as the disciplines that revealed privilege for each dimension. As shown below, epistemic critical thinking was the least privileged of any dimension among these thirty-seven interviews, while text-external critical thinking was privileged the most.

Table 3

Frequency and Disciplinary Privileges of Critical Thinking Dimensions. Ordered by frequency in left column.

Text-external critical thinking (object-oriented): *Texts are a basis for critical thinking about an external "real-world" object.* Frequency: 83.8% (n=31) Privileged by: Accounting, Anthropology, Athletic Training, Biology, Chemistry, Communication Disorders, Counselor Education, Criminal Justice, Economics, Health, History, Kinesiology, Literacy, Management, Marketing, Education, Music, Physics, Public Health, Social Work, Special Education	**Text-internal critical thinking (object-oriented):** *Texts are the principal object of inquiry in the work of critical thought.* Frequency: 35.1% (n=13) Privileged by: Communication Studies, English, Women's & Gender Studies, Geography & Planning, History, Management, Philosophy, Physics, Psychology, Public Health
Subjectivist critical thinking (object-oriented): *Meanings and understandings of objects are always influenced by the interpreter, and we must be critically aware of how our realities inform understanding.* Frequency: 75.7% (n=28) Privileged by: Anthropology, Athletic Training, Chemistry, Communication Disorders, Counselor Education, Criminal Justice, English, Women's & Gender Studies, Geography & Planning, Health, History, Literacy, Management, Marketing, Education, Music, Physics, Public Health, Social Work, Special Education	**Objectivist critical thinking (object-oriented)**: *An objective meaning and understanding of an object can be derived if approached critically.* Frequency of Privilege: 37.8% (n=14) Privileged by: Accounting, Anthropology, Athletic Training, Biology, Chemistry, Communication Disorders, Economics, Kinesiology, Management, Philosophy, Physics, Psychology, Special Education

Deontic critical thinking: *Critical thought is oriented toward possible actions to be taken in regard to an object (what should be done in this case . . . ?).* Frequency: 70.3% (n=26) Privileged by: Athletic Training, Communication Disorders, Counselor Education, Criminal Justice, Economics, English, Geography & Planning, Health, Women's & Gender Studies, Literacy, Management, Kinesiology, Marketing, Education, Music, Public Health, Social Work, Special Education	**Epistemic critical thinking**: *Critical thought is oriented toward reflection on truth and falsity of a claim about the object (is it true that. . . ?).* Frequency: 32.4% (n=12) Privileged by: Accounting, Anthropology, Biology, Chemistry, English, Philosophy, History, Physics, Psychology
Theory-explicit critical thinking: *A defined theory is made explicit as a framework for doing critical work (such as a Marxist critique).* Frequency: 67.6% (n=25) Privileged by: Communication Disorders, Counselor Education, Criminal Justice, English, Economics, Women's & Gender Studies, Geography & Planning, Health, History, Literacy, Management, Marketing, Education, Philosophy, Physics, Psychology, Social Work, Special Education	**Theory-implicit critical thinking**: *A prevailing (doxic) theory (such as empiricism) is implied in the doing of critical work, not made explicit.* Frequency: 35.1% (n=13) Privileged by: Accounting, Anthropology, Athletic Training, Biology, Chemistry, Communication Disorders, Kinesiology, Management, Management, Music, Public Health, Women's & Gender Studies.
Neutralist critical thinking: *Critical thought is directed toward pure understanding without ulterior motive.* Frequency: 67.6% (n=25) Privileged by: Accounting, Anthropology, Biology, Chemistry, English, Economics, History, Management, Marketing, Music, Philosophy, Physics, Psychology, Special Education	**Activist critical thinking**: *Critical thought is directed toward an ultimate or ulterior goal of social or environmental change.* Frequency: 37.8% (n=14) Privileged by: Counselor Education, Criminal Justice, English, Geography & Planning, Health, Women's & Gender Studies, Literacy, Management, Physics, Education, Public Health, Social Work, Special Education
Hermeneutic critical thinking (process-oriented): *The process of being critical is left open and processes are informed by the object/material being considered.* Frequency: 64.9% (n=24) Privileged by: Accounting, Anthropology, Biology, Chemistry, Counselor Education, Criminal Justice, English, Economics, Women's & Gender Studies, Geography & Planning, Health, History, Management, Marketing, Education, Music, Physics, Psychology, Special Education	**Heuristic critical thinking (process-oriented)**: *The process or procedure for being critical is stipulated or outlined in advance.* Frequency: 37.8% (n=14) Privileged by: Athletic Training, Biology, Communication Disorders, Kinesiology, Literacy, Management, Public Health, Social Work

Interpretive critical thinking (object-oriented): *Critical thought is used to make commentary about the nature of material or an object.* Frequency: 59.5% (n=22) Privileged by: Anthropology, Biology, Communication Disorders, Counselor Education, Criminal Justice, English, Women's & Gender Studies, Health, History, Literacy, Management, Marketing, Education, Music, Physics, Public Health	**Evaluative critical thinking (object-oriented)**: *Critical thought is used to make a judgment about the value of material or an object.* Frequency: 56.8% (n=21) Privileged by: Accounting, Athletic Training, Chemistry, Communication Disorders, Economics, English, Geography & Planning, Health, Kinesiology, Women's & Gender Studies, Management, Philosophy, Psychology, Social Work, Special Education

Emergence of Dimensional Strains

Dimensional strains, as described in the data analysis section of this study, are patterns of critical thinking dimensions that emerged after analysis. There are forty-nine possible dimensional strains because there are seven dimensions of difference and two possibilities in each dimension. The probability of each dimensional strain appearing equally is 2.04%. As a result, dimensional strains that appeared more than twice (6.3%) in different academic disciplines are highlighted here as significant.

In analyzing dimensions of difference across disciplines, three dimensional strains (three or more occurrences) emerged within the data of this study; eight dimensional strains were found in only pairs, and twelve dimensional strains were unique, having no other interview transcripts replicating that dimensional strain. In total, 67.5% (n=25) of interview transcripts belong to a dimensional strain that appeared in other interviews and 32.5% (n=12) of interview transcripts were unique, reflecting a straining of critical-thinking dimensions not articulated by any other interviewee.

The most significant dimensional strains are those that were revealed in at least three separate instances as shown in Table 4.

Table 4

Significant Dimensional Strains of Critical Thinking

Strain A: English, History, Physics (n=4)	Text-internal/Subjectivist/Hermeneutic/Theory-explicit/ Interpretive /Epistemic /Neutralist
Strain B: Counselor Education, Criminal Justice, Early & Middle Grades Education, Health (n=4)	Text-external/Subjectivist/Hermeneutic/Theory-explicit/ Interpretive/Deontic/Activist
Strain C: Gender Studies, Geography & Planning, Special Education (n=3)	Text-external/Subjectivist/Hermeneutic/Theory-explicit/ Evaluative/Deontic/Activist

Taking Strain A (Table 3) as an example we see that this exact dimensional strain appeared in 10.8% of interviews (n=4) among the academic disciplines of English (n=2), history, and physics. This study reveals that these four academic disciplines privilege skills that involve thinking critically (1) within the discrete confines of a text, (2) through an awareness of one's biases and assumptions, (3) in a way that is open-ended/non-guided,(4) in a way that names a theory used in the interpretation of an object of inquiry, (5) in order to understand the nature or essential meaning of that text, (6) with a goal of understanding whether or not those claims are true, and (7) without regard to a ulterior agenda of societal or environmental change. While English, history, and physics all deal with objects of inquiry external to text (context, artifacts, physical phenomena), in this study, these disciplines located critical thinking as largely a matter of critical *reading*. For English, this critical reading may be applied to a variety of texts; in history, this critical reading may be applied to interpretations of original source materials; and in physics, this critical reading may be applied to experimental articles. As one physics interviewee explains: "Being critical in physics is about looking at results and saying: Ok, what are the conditions for what these results hold, and can we broaden it? With what conditions? . . . It's about being critical with the results and questioning if the method was right in obtaining the results" (Physics 3). For this professor, those skills come from asking students to carefully read experimental articles and scrutinize methods and results.

Strains B and C are very similar, with the exception that evaluative critical thinking is privileged over interpretative critical thinking. Though only one dimension differs among these two strains, the difference between interpretive critical thinking and evaluative critical thinking might mean an entirely different set of genres, assignments, and expectations on student writers.

The three significant dimensional strains of critical thinking marked above accounted for 29.8% of interview transcripts. That is, about 30% of faculty reported an approach to critical thinking that (unbeknownst to the interviewer or interviewees) was part of a significant pattern of critical thinking among other faculty from different academic disciplines.

An additional seven dimensional strains emerged as paired strains of critical thinking (Table 5); however, only three of these pairings occurred among different academic disciplines (four pairings emerged among responses from the same academic disciplines).

Table 5

Pairs of Dimensional Strains

Biology & anthropology	Text-external/objectivist/hermeneutic/theory-implicit/interpretive/epistemic/neutralist
Economics & special education	Text-external/objectivist/hermeneutic/theory-explicit/evaluative/deontic/neutralist
Philosophy & psychology	Text-internal/objectivist/hermeneutic/theory-explicit/evaluative/epistemic/neutralist

In total, of the interview transcripts analyzed, 32.4% (n=12) reveal unique dimensional strains not reflected in any other interviews, 21.6% (n=8) reveal pairings among the same academic disciplines, 16.2% (n=6) reveal pairings of different academic disciplines, and 29.8% (n=11) reveal significant dimensional strains among three or more different academic disciplines.

Disciplines with Dual Dimension Use

In nineteen instances, both of the two available dimensions of difference were marked because analysis showed evidence that both were privileged in a given academic discipline (i.e., an interview showed privilege for text-internal *and* text-external critical thinking, or objectivist *and* subjectivist critical thinking, etc.). For example, one physics professor articulated an expectation that students can critically read experimental articles and interrogate methodology (a text-internal skill) and also be able to design their own experiments that can help model physical phenomena (a text-external skill). While no academic discipline ever squarely locks into only a single dimension of critical thinking (e.g., critical readers in literature are still considering context and application of knowledge; objectivists in anthropology are still shading their understanding of ritual with their own cultural experience), the instances in which interviewees explicitly expressed both dimensions are noteworthy. These instances are noteworthy because they may indicate highly complex expectations for student critical thinking (expectations of multiple complex mental tasks at once) that could bear further articulation. These instances occurred as follows:

Instances of Text-internal and Text-External Privileging

- A women's and gender studies professor privileged text-external and text-internal critical thinking because in an academic discipline concerned with how gender stereotypes become normalized, text may be a primary device of normalization. This professor also privileged theory-implicit

critical thinking in that postmodern power relations are the implied backdrop of understanding gender normalizations, but theory-explicit critical thinking is privileged by identifying intersectionality, Marxism, etc. This professor also privileged evaluative critical thinking in that students are asked to determine how power relations are being reproduced in, say, an advertisement, but also interpretive critical thinking is privileged in that students can determine the nature of society as normalizing particular gender stereotypes.

- A geography and planning professor privileged mostly text-external critical thinking, as students examined non-textual concepts like *access to food in areas of urban poverty*, but the public policy and law policy aspect of this discipline requires students to do critical interpretations of text in and of itself as they are asked to read, write, and evaluate the impact of written public policies.
- A history professor privileged mostly text-external critical thinking in interpreting the past, but text-internal critical thinking is highly valued when text (especially original source evidence) is the object of historical study.
- Two different management professors privileged primarily text-external critical thinking with ethical decision making in case study scenarios as the object of inquiry, but text-internal critical thinking was privileged in that students must also think critically about the ethics of a source and the implications of a theory, which comes from close reading of those texts.
- A public health professor privileged text-internal critical thinking in the case of scientific literacy, and emphasized the importance of students doing close readings of health research articles; however, this professor also privileged text-external critical thinking, as students must learn to make connections between culture and disease.

Instances of Objectivist and Subjectivist Privileging

- An anthropology professor privileged both objectivism and subjectivism because culture can be objectively known, but we must also know ourselves and our own cultural influences and be attuned to them in anthropological work.
- An athletic training professor privileged objectivist and subjectivist critical thinking because diagnosis of injury is objective, but there must also be an intense awareness of how trainer bias influences diagnoses, making "metacognition" a central premise of critical thinking for athletic trainers.

- A chemistry professor privileged objectivist and subjectivist critical thinking because while objectivity is needed to control a chemical experiment, the interviewee also sees being critical as partially recognizing one's own subjectivity without "devolving" into relativism
- A music professor privileged objective critical thinking in that the past is knowable and should inform a performance of historical music, but subjectivist critical thinking was privileged in that part of a musical performance, however much it may be historical, is always original in some way to the performing musician.
- A physics professor privileged objectivist critical thinking as a matter of controlling experimentation of physical phenomena, but also privileged subjectivist critical thinking in explaining that students' thinking and the "length-scale" of humans in general always informs an experimental design and the creation of predictive models; humans are always subjected to interpreted physical phenomena from the length-scale perspective of the human being. A second physics professor mostly privileged text-external critical thinking about physical phenomena under experimentation, but also privileged text-internal critical thinking to the extent that critically reading other scientists' work is paramount to developing critical thinking skills in science.

Instances of Heuristic and Hermeneutic Privileging

- A biology professor privileged heuristic critical thinking as a matter of "the deductive reasoning process," but also privileged a hermeneutic process of open-ended questioning that forms the biological research question or object of inquiry at its outset.

Instances of Evaluative and Interpretive Privileging

- A communication disorders professor privileged evaluative critical thinking in the determination of a final clinical decision (how a client should be treated), but interpretative critical thinking as vital to the initial assessment of the situation or case.
- A communication studies professor privileged evaluative critical-thinking skills as essential to determining the effectiveness of a work of communication, but interpretative critical thinking as a means of invention in determining how to act in a given scenario.
- An English professor privileged interpretive critical thinking in cases in which English students may be determining an ultimate or important meaning of a text, but evaluative critical thinking was privileged in

scenarios where students were critiquing a work and valuing that work as strong, weak, etc. This professor also privileged neutralist critical thinking in situations where texts are reading for pleasure or interest alone, and activist critical thinking in situations where critical readings of text are linked to a broader agenda.

- A health professor privileged evaluative critical thinking and interpretive critical thinking. While evaluative critical thinking seems to dominate as students are asked to determine whether a way of thinking about health conditions is valuable and healthy, interpretive critical thinking is also privileged in that students use the science of psychology to make claims about the nature of humans and human health.

As this analysis reveals, critical thinking dimensions are not clear-cut lines. While many disciplines clearly privilege one dimension over another, there are also clear cases where interviewees explicitly described an expectation of dual dimensions in critical thinking, especially the cases of text-internal close readings and text-external application of knowledge; cases of objectivist and subjectivist thinking expectations; and cases of evaluative and interpretive thinking.

Limitations

While this work does validate many of Moore's initial findings in a different institutional and geographical setting, further research is required to determine how critical thinking may be approached differently at differently classified institutions. Both the present study and Moore's study involved faculty teaching at large public universities (>15,000 students) both of which are located in suburbs of major metropolitan areas (>4 million people). Repetition of this study at institutions such as two-year and community colleges, small liberal arts colleges, rural universities, and technical colleges may yield different conceptions of critical thinking across the curriculum.

An additional limitation of this study is its emphasis on academic conceptions of critical thinking alone. In many instances interviewees in this study implied that the critical-thinking skills they emphasize in the classroom are essential for professional success, but this is not the same as an examination of the critical-thinking skills that private, public, and non-governmental organizations look for among their employees. Future research examining employer conceptions of critical thinking in their profession would be an important step in examining to what extent academic valuing of critical thinking maps on to professional valuing of critical thinking.

Finally, further research might examine the degrees of variation in privileging dimensions of critical thinking within a single discipline. It's unclear how much diversity in views about critical thinking might emerge in, say, twenty interviews with faculty from a single academic discipline.

Discussion

The results of this study have significant implications for writing across the curriculum pedagogy and writing studies research.

Some Implications for WAC/WID

Re-casting writing instruction for fellow faculty not as a matter of teaching students to mimic a general academic style, but as a matter of teaching students to be critical, disciplinary thinkers is one of the greatest challenges I've faced in my time as a WAC director and coordinator of faculty workshops. But despite decades of scholarship and grassroots work by writing program administrators, many faculty don't automatically correlate writing and thinking, preferring instead an antiquated notion that writing is merely sharing or transmitting critical thoughts that happen (somehow) outside of language. Another great challenge that many WAC directors face is guiding faculty away from a view that their expectations for student writing are general expectations for all writing, and toward an understanding that their expectations for student writing are quite specific to both their discipline and their personal taste as a reader. Debates about grammar and style expectations during faculty workshops—like the oft cursed split infinitive—muddy workshop leaders' attempts to get to the heart of the matter, which is that these stylistic preferences are more deeply rooted in preferences, expectations, and epistemological nuances of the disciplines, activity systems, and genres at work. That is, the more immediate stylistic concerns that get emphasized in so many of our conversations with faculty about student writing, are really representative of much deeper disciplinary expectations for thinking within a discipline that go unarticulated. A faculty members' frustration with student use of first-person in a research essay, for example, might be better understood as an indication of that faculty member's privileging of *objectivist critical thought* over *subjectivist thought*. The dimensions of critical thinking detailed in this study, I find, offer a compelling vocabulary for WAC directors seeking to address both of these common challenges.

During the time that I've undertaken the research in the present study, I've subsequently begun talking more with faculty across the curriculum about what they value in student thinking and writing in terms of how they want students to engage with texts, their preferences for objectivism or subjectivism, whether they dictate hermeneutic or heuristic inventive process, how they expect students to engage with theory, etc. These are conversations about the kind of thinking faculty value from students in their disciplines, but those values also get presupposed (deliberately or not) into expectations for student writing and into student assessment and assignment design. I've found that enthusiasm to discuss critical thinking among faculty far exceeded the enthusiasm I've witnessed in discussions about writing conventions alone. Yet, we see from landmark works like John C. Bean's *Engaging Ideas* (2011) that writing is

as much about advanced and critical thought as it is about effective communication of those thoughts; indeed, we know that clarity is often a result of advanced thinking about an issue. The results of this study affirm that beneath a general notion of critical thinking lies a set of critical-thinking dimensions that become privileged across disciplines, courses, and faculty preferences. These dimensions of critical thinking are important to understand because in many cases they may subtend disciplinary writing conventions and the rhetorical features that faculty privilege in assessing student writing.

Implications for Writing Curriculum Development

This study affirms the value of viewing critical thinking as a set of general skills in which different academic disciplines may privilege different dimensions, while all dimensions remain valued by those disciplines generally. What this means for writing curriculum development is that a closer assessment of the critical thinking dimensions that are privileged by students' academic disciplines could powerfully inform pedagogy in first-year and writing-emphasis/intensive courses.

For example, in a first-year writing course in which many education majors are enrolled, what assignments might best prepare those students for the critical thinking expected of them in future work? If a dimensional strain among educators (1) privileges the use of text (2) as the basis to think about non-textual scenarios (3) through an awareness of one's biases and assumptions (4) in a way that is open-ended/non-guided (5) that names a theory used in the interpretation of an object of inquiry (6) in order to determine what should be done about an issue and (7) in order to improve a defined societal or environmental issue—might that lead to different kinds of rhetorical analysis, genre awareness, and composition techniques for these future writers in the field of education?

First-year writing programs are often limited in regard to disciplinary writing instruction because students are commonly in their first year of studies and have little knowledge of their own discipline from which to draw, even if these students are grouped in learning communities. More often, first-year writing courses are populated with students from very different majors and/or undecided/undeclared programs. First-year writing courses could instead introduce students to all fourteen dimensions of critical thinking and practice composing in genres that embody specific strains of these dimensions. This might powerfully prepare students to transfer knowledge of critical thinking moves that writers make into the genres of their future disciplines.

In writing-emphasis courses or writing-enriched curricula, a better understanding of the dimensional strains privileged by different academic disciplines might become an excellent starting point for suggesting writing-to-learn assignments to

faculty across the curriculum. If faculty in, say, counselor education, privilege subjectivist critical thinking, might some writing-to-learn assignment focus on a reflection of student biases and assumptions? If faculty in geography and planning privilege deontic critical thinking, might some writing-to-learn assignments focus on explaining how an essay conclusion in that discipline should inform public policies? If faculty in physics value critical thinking as linear trains of thought in research writing, might some writing-to-learn assignments introduce syllogistic exercises?

Implications for General Education Assessment

The implications of critical-thinking dimensional strains don't just apply to composition courses. A deeper understanding of critical thinking's dimensional strains should encourage general education programs at universities to think more specifically about how the general education curriculum educates students on different dimensions of critical thinking. Such a model would look far different than merely stipulating "critical and analytical thinking" as a general education goal, which consequently gets attached to most general education syllabi without attention to which critical thinking skills are being emphasized. Furthermore, general education programs attaching specific student-learning outcomes (SLOs) to general education goals might use these critical-thinking dimensions as outcomes further articulating a general goal of critical and analytical thinking. These are the very goals writing courses so often have as attributes, but so rarely get articulated in specific ways.

This study is a mere continuation of a growing conversation in WAC/WID and writing studies research that examines more specifically how assumptions about critical thinking in disciplines get embedded into the genres and exercises we ask our students to write. Composition researchers in WAC/WID have long fought for acknowledgment across higher education that writing, invention, and epistemology are inexorably intertwined, and that writing instruction is not remedial but a premiere place for creating sophisticated student thinkers. The institutional cache of critical thinking offers such composition researchers an important opportunity to more specifically detail writing's role in developing critical thinkers.

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