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# An Act of Translation: The Need to Understand Students' Understanding of Critical Thinking in the Undergraduate Classroom

Tiffany Gayle Chenault and Elizabeth Duclos-Orsello[1]
*Salem State College, Salem, Massachusetts, 01970*

**Abstract**

This article extends and expands the existing literature on critical thinking (CT) by both establishing the need for more student-centered research on the topic and reporting on the findings of a CT research project with two central, related goals: 1) To record and analyze undergraduate students' definition of CT and 2) To create an easy-to-use instrument that can assist faculty members across many disciplines identify and understand their students' use of the term so as to improve both teaching and learning. In this article an overview of the limits of existing CT research is followed by a discussion of the project's three, related phases and the initial findings of each. Central to our task is improved classroom teaching.

In Phase I an open-ended two-question questionnaire was given to students enrolled in sociology and interdisciplinary courses in two departments during the 2005-2006 academic year (*N = 157*). In the first question, students were asked simply to "define CT". A qualitative analysis of the data revealed not only wide variation in undergraduate students' use and understanding of the term generally but also wide variation among students in any single classroom. Using the most common student-generated definitions of CT from the survey data, in Phase II we developed and piloted a classroom-ready instrument designed to allow faculty to quickly and simply assess their students' understanding of the term "CT". Faculty who piloted the instrument in Phase III generally found it to be user-friendly and pedagogically valuable. Our overall findings suggest both the need to continue student-centered research in the area of CT and the potential pedagogical value of a student-centered classroom instrument such as the one we created.

**Keywords:** Critical thinking, student centered, assessment tool, teaching.

## The Importance of Critical Thinking in Academia and Our Search for the Missing Link

For university faculty, developing and shaping students critical thinking skills is an important goal (Browne & Litwin, 1987; Vesely & Sherlock, 2005).

[1] Corresponding author's email: educlosorsello@salemstate.edu

As faculty in Sociology and Interdisciplinary Studies, we teach many courses with critical thinking as a course objective. Furthermore, the mission statement of the School of Arts and Sciences at our public four-year institution highlights critical thinking as a school-wide focus, and critical thinking was recently the subject of an entire year's worth of readings and discussion through our institution's Council on Teaching and Learning. However, academic interest does not always translate into either pedagogical innovation or teaching success. In fact, both our classroom experiences and recent scholarship suggest that students have a difficult time applying critical thinking skills to tasks and assignments (Tsui, 2002). At the same time both classroom experience and existing scholarship suggest that there is widespread discrepancy in how the term "CT" is used (Lauer, 2005; Zygmont & Schafer, 2006), understood (Ennis, 1989), and applied (Lewis & Smith, 1993; Porta & Dhawan, 2006; Shepelak, Curry-Jackson, & Moore, 1992) by scholars and faculty. The impetus for the work in this article was a concern that the literature on CT did not adequately offer a way to bring these two lines of research (and concern) together. Nor did the existing literature attend adequately to what we believe is most critical to faculty members engaged in the CT debate: finding practical ways to improve the critical thinking abilities of our students and our teaching of the same.

Most surprising to us as we reviewed the CT literature in 2005-2006 was the relative absence of scholarship exploring how *students* define or understand critical thinking. Although the literature on CT broadly (and in higher education specifically) is vast, with very few exceptions it has focused on either defining "critical thinking" or exposing definitions/uses of the term from the position of faculty/scholars. What is all but absent is a thorough exploration of how students perceive, use, and understand the term "critical thinking" when they encounter it in a classroom setting. We wondered in the fall of 2005 not only what our students thought of when they heard *us* use the term "critical thinking" in our classrooms and course materials, but also how *they* defined or used the term independent of any meanings we assigned to it. We hypothesized that 1) individual students might have multiple responses to the simple request to "define critical thinking", 2) that students in the same classroom might not understand or use the term in the same way, and 3) that students' definitions might not mirror those of a given faculty member or discipline. We imagined that if such variations or contradictions existed so too would there exist challenges for students charged with engaging in CT activities or demonstrating CT skills. Furthermore, these discrepancies would pose a challenge for faculty members when designing assignments or assessment tools related to CT objectives. If this type of disconnect was in fact occurring in our classes then student learning might suffer, assessment data might be skewed, and frustration might result—for both faculty and students.

These potential challenges and troubling outcomes, combined with the limited (non student-centered) focus of much of the existing critical thinking research convinced us not only to continue investigating questions around student use and understanding of "critical thinking" but also to try and develop a simple tool to help faculty members gauge students' understanding or use of the term in a real-world classroom setting. We embarked on this project believing that with this type of baseline knowledge in hand, we, as faculty members, could help our students understand and master the skills we are looking for

when we discussed or referred to "critical thinking" and thus, achieve desired learning outcomes no matter what our discipline.

## Scholars Defining Critical Thinking

There is an extensive literature about CT in higher education (and an even greater one on CT in general) spread throughout the scholarly writings of a diverse set of academic fields. Many scholars have labored to craft detailed definitions and taxonomies distinguishing the characteristics of "critical thinking" among college students from other forms of thought. Yet, without a doubt, while the term "critical thinking" has been pervasive in academic literature and discourse for more than two decades (at both the theoretical and pedagogical levels) it lacks any clear, consistent definition or usage (Petress, 2004).

Ennis' work from the 1980s and 1990s was central to shaping the general discussion of CT in higher education. His early conceptualization (1981) limited "critical thinking" to the ability to correctly assess statements . In this work there was no reference to the formulation of hypotheses, formulating alternatives or developing plans for action/experiments. These activities Ennis claimed were part of "creative" thinking. In short, his early focus was on the *process* of thinking. However, by the late 1980s and early 1990s Ennis had rethought his early definition and broadened it to include the very acts of "creative" thinking that had previously been excluded. His new formulation included a range of interdependent (non-hierarchical) skills and aptitudes which together allowed a person to engage in critical thinking now defined as "reasonable reflective thinking focused on what to believe or do" (Ennis, 1991, p. 180). To guage an individual's competence at "reasonably reflective thinking" Ennis offered up a set of ten specific tasks thereby establishing a litmus test of sorts for identifying or asessing CT. [2]Also writing in the 1980s and 1990s and adding to the panoply of definitions and conceptualizations of critical thinking were people like McPeck (1981) who defined CT as "reflective skepticism", Facione (1984) who formulated a conception of CT that included not only evaluating arguments, but the active process of constructing them, and Paul and Nosich (1992) who defined CT as "disciplined, self-directed thinking which exemplifies the perfections of thinking appropriate to a particular mode or domain of thought".[3]

[2] Ennis' list included the following: Judge the credibility of sources; Identify conclusions, reasons and assumptions; Judge the quality of the argument, including the acceptability of its reasons, assumptions, and evidence; Develop and defend a position on an issue; Ask appropriate clarifying questions; Plan experiments and judge experimental designs; Define terms in a way appropriate for the context; Be open-minded; Try to be well-informed; Draw conclusions when warranted, but with caution. See Ennis 1993 "Critical Thinking Assessment" *Theory into Practice*, vol. 32 No. 3 (Summer 1993), 179-186 for this abridged discussion on page 180,; this is also discussed and defended in Ennis 1987 and 1991.

[3] Sociologist H. Reed Geersteen (2003) argued for seeing "critical thinking" and "reflective thinking" as two "different though complementary" forms of thinking.

In 1993 Lewis and Smith proposed that in the existing literature and usage there were three distinct meanings given to term "critical thinking": "(a) critical thinking as problem solving (b) critical thinking as evaluation or judgment (c) critical thinking as a combination of evaluation and problem solving."(p. 134). Here, "critical thinking" appears to refer to both the act of thinking (and how it is carried out) and the outcome of that thinking. The result of such a "conceptual swamp" according to Lewis and Smith was that in many cases scholars and teachers in the humanities were using "critical thinking" to refer to evaluative skills/activities, while those in the sciences were making use of it as a synonym for problem solving. While these may not be seen as dichotomous to some, Lewis and Smith protested this divide, claiming that "all disciplines need both types of thinking skills." (Lewis & Smith, 1993).

In the early twenty-first century L. Dee Fink reversed the trend toward collapsing multiple types of thinking into the definition of CT when, he separated "critical thinking" from "creative thinking" and "practical thinking" assigning only the tasks of analysis and evaluation to the "critical" category (2003, p. 40-41).

At about the same time, when exploring the schematics and definitions for CT used by scholars in general as well as those published in discipline-specific literature, Petress (2004) found that 1) any unified usage of the term was lacking and 2) many definitions/scholars highlighted certain acts or processes at the expense of others which alternative definitions/scholars emphasized as central.

In brief, for nearly three decades scholars, academics, and instructors have made clear the academy's difficulty in defining CT. How then can faculty expect students to have a clear, consistent definition or understanding of the term from one day to the next, from one class session to the next, or from one course of study to the next? More importantly for college instructors is the lack of student-focused research amid this sea of top-down research focused on scholars' theories and schemas. CT scholarship has all but ignored student voices in its attempt to rein in a complex term at the center of pedagogical and policy debates alike.

## Students' Voices and Critical Thinking

Surprisingly, the literature about college students and CT lacks any substantial focus on the voices of those students who are being asked to "think critically". Rather, as highlighted above, the vast majority of critical thinking research has focused on either 1) comparing and discussing the various ways in which scholars and professors define and use the term or, as we outline here below, 2) assessing students' ability to think in a way that fits an existing scholar/faculty-created framework, matrix, or definition .

Many scholars have reported on students' abilities in the area of CT based on results of assessments tied to pre-existing definitions and related criteria. For instance, Weast (1996) asked his students to take a pre and post test which evaluated their CT skills. His rating system was based on Browne and Keely's (1986) model to evaluate critical thinking. Shepelak et al. (1992) developed a four page research questionnaire to assess stu-

dents' response to CT skills. Students were asked if they had adequate opportunities to communicate through speaking, writing, and to develop critical thinking and communications skills. Shepelak et al. wanted to redress some of the shortcomings in previous research that focused on the acquisition and development of student's CT skills. To measure students' ability to think Grauerholz and Bouma-Holtrop (2003) relied on the work of Green and Klug (1990) and Geersten (2003) to develop an eleven point item scale.

Even the use of a quantitative test such as the Watson Glaser Critical Appraisal, or the Cornell Test of Critical Thinking to measure students' response to CT does not directly ask students how they define the term. Such an approach assumes a given definition of CT and simply assesses students based on the same. As a result of this overwhelming emphasis on existing CT schemas in 1997 R. Barnet noted that we have "no proper account of [student's experience of critical thinking]" Yet, to date this type of account is precisely what is generally missing in the research.

Our project (in addition to correcting the general absence of student-centered research) grew from our belief that there is an imperative for instructors to be effective, responsive educators. More specifically, our project emerged from our belief that student-centered research AND responsive teaching are intimately related. In 2002 Tsui pointed out that there was an absence of critical thinking studies that explored the impact of "instructional factors." We suggest that a first step toward redesigning of evaluating instructional practices *must* be a closer look at the way in which the term "critical thinking" is used among and by the students we teach.

***Students Understanding of Critical Thinking***

To date, the most significant effort at assessing students' own definitions of CT is Phillips and Bond's 2004 study. For the purpose of understanding how students define CT, Phillips and Bond recognized that not only was there an overwhelming literature on CT which was "both 'confused and confusing', but also that there was little research on university students' "experiences" of CT. They were interested both in how students defined "critical reflection" and in understanding what students thought about when they were engaged in critical reflection. What Phillips and Bond discovered was a wide variation in both definitions of "critical reflection" among their small student sample and in the activities that students identified as employing or demonstrating the same. In fact the researchers identified four unique experiences of "critical reflection" which ranged from the "relatively simple" to "more complex and hermeneutic" such as "looking beyond what is there" (p. 289). Important to *our* work is that despite the fact that Phillips and Bond's study was conducted as part of a course "in which the aim was the development of effective reasoning and where critical reflection was a predominant theme" (p. 287), they found that at the end of the semester "students' experiences of criticality and the language they used to describe the experiences were limited." All in all according to the researchers, "given the emphasis of the course, the way in which students in the sample constituted critical thinking was disappointing" (p. 293).

While we are buoyed by the existence of Phillips and Bond's work, our project pushes the discussion even further and suggests that what is most important about studying what college students think of critical thinking may NOT have anything to do with what we, as instructors, say it is. We believe that college and university faculty members must better understand both their own and their students' use of the term CT in order to engage in effective pedagogical practices. Thus, our study differs from and extends Phillips and Bond's work because we looked at students' across/from different disciplines, courses, and years in college, and we studied students' definitions of critical thinking with an eye beyond simply categorizing their responses. While we did analyze their responses, our ultimate aim was to use the data to create a practical classroom-ready instrument for instructors that was useful but neither invasive nor time intensive.

## Scope of Project, Methods and Data

The aim of our project was twofold: 1) understand how students define CT without reference to existing schemas/definitions and 2) create a practical, classroom–ready instrument for instructors to determine the same. As a result, our work was divided into three phases which we present here. In Phase I we analyzed patterns and/or themes that emerged when students responded in writing to two open ended questions. In Phase II we translated our analysis into a classroom-ready instrument. In Phase III we piloted the instrument and analyzed faculty responses to it.

### *Phase I: Data Collection & Analysis*

To investigate how students define and understand CT we collected data from State College (SC) students during the 2005-2006 academic year and utilized a qualitative methodological framework. [4] State College is a four year public college in New England with a student population of 10,500 students (undergraduate and graduate, day and evening).

We obtained data from undergraduate students enrolled in five sections of Introduction to Sociology (SOC 201), six sections of First Year Seminar (IDS 108), and one section of Topics in American Studies (IDS 333) during the 2005-2006 academic year. In the fall 2005 semester our open-ended questionnaire was distributed to two sections of Introduction to Sociology (201) and three sections of First Year Seminar (IDS 108) for a total of 65 respondents. In spring 2006 semester we collected responses from students enrolled in three sections of Introduction to Sociology (201), three sections of First Year Seminar (IDS 108), and one section of Topics in American Studies (IDS 333). 92 students responded in the spring semester for a total N = 157.

The sections of each course were taught by the same professor. The students ranged from first year students to seniors and had a wide variety of majors beyond Sociology and Interdisciplinary Studies. Both of our syllabi listed CT as a goal but we had not spent class time exploring the term or offering any explicit definition prior to conducting our research. During the second week of each semester students were asked to fill out the

[4] We received IRB approval in 2005

anonymous questionnaire. We asked students to answer two open ended questions: 1) What is critical thinking? and 2) Give 2 examples of when you have used critical thinking in your daily life. For the research presented here our work in Phases II and III focused solely on responses and data from question #1. [5]

After collecting the data from the open–ended questionnaire we transcribed the responses to question #1 in an editable file of rich text into QSR NVIVO qualitative software. We

**Figure 1. Category of Nodes.**

| | | |
|---|---|---|
| ability | do on your own | pushing envelope |
| abstract way | draw conclusions | questions |
| act upon situation | efficient_logical_most | questions_asking |
| analyzing | end result | rationalization |
| answer questions | evaluate | read below the surface |
| answer_correct_make sense | examine_situation | reading between the lines |
| answer_right | expanding thoughts | reasonable decisions |
| answer_support | explore | reflect |
| answers_in depth | focused | relate it to something |
| apply it | how to think | researching |
| applying to situations | idea | scientific methods |
| ask questions | important | second quessing |
| assess_ what needs to be done | In-depth thinking | sharpen skills |
| best answer_solution | information | situations |
| beyond true and false | interpret | skills_thinking |
| beyond whats there | involved_deeply | solution |
| bias_stay away | judgmental | solve a problem |
| brainstorming | learned | summarizing |
| breaking things down | learning on a different level | think_an issue |
| circumstances and consequences | look at something | think_deeper |
| common thought | memorized information | think_different level |
| concentrate on important parts | mental capacity | think_hard |
| conclusion_come up with | narrow something down | think_logically |
| creative | not accepting something | think_take time |
| critical to decisions | opinion | thinking |
| critically | overview | thought_lots of |
| criticize_other views | own_view | understand |
| critique | perspective | use mind |
| decisions_make | plan things out | using all the evidence |
| deeper meaning | point of view | using knowledge |
| details_support answer | problem | taking apart |
| details_using | problem_beyond | taking other things into consid-eration |
| different approaches | problem_faced with | theory |
| different methods | process | think outside the box |
| different outcomes | process information | think_all aspects |
| different meanings | pull apart | |

[5] While analyzing the raw data from both questions we noticed that responses to question #2 dealt disproportionately with non-academic subjects. We hypothesized that this resulted from the fact that we asked students to give examples of critical thinking in their "daily life" instead of asking them to give examples of critical thinking in the classroom. The non-academic focus made correlation with question #1 difficult.

used the software to identify key words and patterns, and to develop descriptive, clarifying terms (free nodes) for describing patterns of students' definitions. Asking students how they define CT showed major variation in student generated responses and definitions. There were 108 distinct nodes that students used to define CT. The number of times the nodes were repeated in students responses (passages) ranged from 26 to 1 (See Figure 1).

We then re-examined these nodes and condensed the list from 108 to 98 (See Figure 2) by creating groups of nodes (Trees of Nodes), eliminating synonyms and clarifying some language (since in a number of instances there were only slight variations in student re-

**Figure 2. Nodes with the Most Passages.**

| Category of Nodes | Passages Coded |
|---|---|
| Thinking | 26 |
| Analyzing | 25 |
| Think outside the box | 18 |
| Think: Different Levels | 18 |
| In Depth Thinking | 14 |
| Solution | 10 |
| Solve a problem | 10 |
| Idea | 9 |
| Opinion | 9 |
| Making Decisions | 8 |
| Questions | 8 |
| Answer questions | 7 |
| Ask questions | 7 |
| Understand | 7 |
| Using Knowledge | 7 |
| Brainstorming | 6 |
| Information | 6 |
| Situations | 6 |
| Apply it | 5 |
| Thought lots of | 5 |
| Common thought | 4 |
| Deeper Meaning | 4 |
| Evaluate | 4 |
| Focused | 4 |
| Perspective | 4 |
| Asking Questions | 4 |
| Think deeper | 4 |
| Think logically | 4 |
| Use mind | 4 |
| Answer correct | 3 |
| Beyond true and false | 3 |
| Interpret | 3 |
| Judgmental | 3 |
| Process | 3 |
| Think an issue | 3 |
| Think hard | 3 |
| Think: take time to | 3 |
| Ability | 2 |

sponses). For example the Category Node "Thinking" included original responses such as" think logically", "all aspects of thinking", "taking time to think", "think hard", "think deep", "think about an issue". The Category Node "Answer" includes responses such as "answering questions", "having the right answer", "answer something in depth", "answer correct".

We found that within every specific class students' definitions of CT varied (See figure 3). For example in Class A with 26 students, there were 18 different definitions of CT. Five students defined "CT" as "Thinking outside of the Box". Other answers varied from "mental device for problem solving" to "using evidence" to "helps you to focus" to "knowledge for answers" to " learning on different levels". This type of variation was present in the data collected from other classes as well.

**Figure 3. Distribution of Definitions by Class.**

| Class | # of Students | # of Unique Definitions of CT |
|---|---|---|
| A | 26 | 18 |
| B | 23 | 11 |
| C | 4 | 4 |
| D | 14 | 8 |
| E | 12 | 10 |
| F | 15 | 12 |
| G | 21 | 15 |
| H | 12 | 10 |
| I | 18 | 15 |
| J | 5 | 5 |
| K | 7 | 5 |

In Class B with 23 students there were 11 different understandings of "CT". Although 5 students thought "CT" meant "thinking deeply" two students defined it as "brainstorming" and another two students stated that CT meant to "analyze what you read". The remainder of the students stated the "CT" was defined as: "helps you draw conclusions", "come to an opinion", "means your [sic] open-minded", "apply knowledge", "deal with circumstances and consequences", "ask questions", and "use knowledge".

In Class C—with only 4 students—we recorded 4 unique definitions:

1) "Critical thinking is when you question and think seriously about any given topic. Also you may look beyond actual facts and may come up with an explanation."

2) "Critical Thinking is when you are faced with a situation/question that you need to make a decision on. It requires you to not make an emotional decision but one based on consequences and benefits of the decision. "

3) "Critical thinking is when you must think deeply about something. It is not just a quick though. You have to really put effort into what you are thinking."

4) "Analysis of a statement or statements; ideas, etc and thinking about how they agree or disagree with your thoughts, ideas, perceptions, etc; and causing you to decide/examine the pros & cons."

As these four students' responses indicate, in one (small) classroom learners may understand CT to be primarily about questioning, primarily about considering facts rather than emotions, primarily about putting effort into a decision, or primarily about exploring the pros and cons. In general, these four definitions point out that any one student may hold a definition of CT that combines elements of two or three "definitions" of CT as established by faculty/scholar-centered research. As instructors, we were particularly interested in the general finding that within the same classroom students' understandings of the term "CT" varied just as much as those of scholars and researchers scattered throughout the CT scholarship.

***Phase II: Creating and Distributing Classroom Instrument***

Because the central goal of our research was to improve teaching and learning, after analyzing the responses from students in phase one, we used our student-generated data from Phase I to create a student and faculty-friendly instrument for assessing students' understanding of CT in a real-world, real-time, classroom setting.

The paper and pencil instrument we developed was based on the findings of our Phase I research and was designed to allow faculty members to quickly ascertain the range of students' definition of CT in a minimally-invasive, time-efficient manner without the need for complex equipment or data analysis software. In addition the instrument was designed to afford faculty members the opportunity to compare students' definitions with their own.

Our diagnostic included written instructions for both faculty and students. The student portion of the instrument consisted of a list of the top 20 definitions of critical thinking as identified by frequency of response by students in our sample. Students were instructed, in writing, to 1) Read through all the words and phrases [listed] 2) Circle the **ONE** word or phrase that BEST matches **YOUR** definition of "CRITICAL THINKING". Faculty members were instructed (also in writing) to answer the same question that the students answered on a sheet identified as the FACULTY INSTRUCTION SHEET. Faculty members were then instructed to collect the student responses and tally them on the SUMMARY KEY for FACULTY. This Summary key contained three columns: one listing the 20 definitions, one for recording the faculty response and one for tallying the number of student responses for each definition. (See Appendix A-C).

***Phase III: Evaluating Instrument***

We piloted this instrument in the spring of 2007. Our goal was to determine 1) how representative and transferable our clarifying terms and identified patterns were for use across a number of disciplinary boundaries and 2) how user-friendly the instrument was for both students and faculty. Five faculty members in the departments of English, Political Science, Interdisciplinary Studies and Geography volunteered for the pilot study. Each administered the survey near the end of the 2007 spring semester. The faculty received no training in administering the survey other than instructions to read and follow the directions on the survey itself. After piloting the instrument faculty participants answered a follow-up survey pertaining to the instrument's usefulness and ease of use. (See, appendix A-C). The results of this follow-up survey offer important insights for the future of our instrument or others like it.

***Usefulness of Instrument***

On a scale of 1-5, 5=strongly agree and 1=strongly disagree; faculty gave the instrument a rating between 4 and 5 for being useful. All faculty respondents "agreed" or "strongly agreed" that the instrument provided them with information they could use to inform their teaching.

***Ease of Use***

On average faculty members stated that it took between 2-5 minutes for their classes to complete the student survey. On a scale of 1-5, 5=strongly agree and 1=strongly disagree, faculty gave the instrument a rating between 4 and 5 for being user friendly. All respondents rated the simplicity to distribute and score a 5. Asked whether the instrument was simple enough to encourage them to use it in a future course, faculty members responded with 4 and 5 ratings.

***Open Response: Future Implementation of Instrument***

Finally, we asked the faculty to list any ways in which they could imagine making use of this instrument to inform their teaching. While their responses varied, 4 of the 5 faculty who piloted the instrument offered specific ideas for using it in their classrooms. One suggested that the instrument "provides a solid starting point to talking with students about this important skill." Another faculty member suggested that she might use the instrument more than once. She stated she "would use this two times, once at the beginning and once at the end of the semester." According to a third respondent the instrument would encourage her to think about the range of student views on any number of course-related topics. She indicated that she might consider "Develop[ing] more process-orientated lesson plans particularly ones that suggest a variety of ways to approach an issue." Finally, the fourth respondent saw this instrument as a way to understand her own students' ideas about CT. In her words this instrument would help her "Identify the preconceptions that a particular class might have about critical thinking and working through them."

## Limitations and Areas for Further Research

There were several limitations to our study. First, when analyzing responses in Phase I we could have coded for class, rank, major, and gender (or other variables) among our student subjects in order to explore whether there were certain definitions that were particularly common among subsets of students. This type of data coding might have offered us data for developing classroom instruments more specifically geared toward faculty who are addressing a particular set of students (e.g. first year students or students in a particular major).

Second, given our need to discount the second section of our original 2-question questionnaire, we unable to address the very important issue of whether there was continuity or discrepancy between the way any single student defined "critical thinking" and the specific examples he/she offered as examples of the same. Such analysis would no doubt allow the scholarship on critical thinking to move forward even more, as it would suggest some relationship between abstract and practical understandings of the term—data that many faculty members would certainly find useful.

Finally, we would have liked a larger and more multi-disciplinary group of faculty testers to assess the usefulness of the instrument for broader dissemination. Our faculty sample size in Phase III was small and while the responses were promising with regards to creating an instrument that works for many different departments at institutions like ours, because our instrument was developed based on responses from students in only two departments, we were not surprised to hear that some faculty testers (and students in those classes) did not see "their" definition of critical thinking reflected in the choices offered. We might have added an optional "Other" free response line on the instrument. However, given that our task was to present a list of "most common" responses and use the instrument pilot as a way to test the usefulness/representative nature of our findings, restricting all pilot subjects to the list offered made most sense. In addition, and perhaps most importantly, in order to make the instrument easy to use in a classroom setting, the limited choices seemed most appropriate, a fact that our faculty pilots seemed to recognize. This is an area rich for further research.

## Discussion and Conclusion

Previous research on students understanding of CT has been limited to faculty and researcher perspectives on the topic. Thus, this study moves CT research forward by explicitly focusing on the student voice and offering faculty a tool to engage their student's authentic and useful discussions on a central topic in higher education. Similar to Phillips and Bonds' work we agree that there is a need to understand student-centered understanding of CT. However, unlike Phillips and Bond, we were not ultimately interested in the relative success or failure of students to reach or demonstrate any particular understanding of CT. Simply put, we wanted to listen to students' voices and use their own definitions as the basis for connecting findings about student understanding of CT with pedagogical implications. If the existing scholarship is any indication, faculty do not know how students understand CT, let alone how they apply it in the classroom. From a peda-

gogical standpoint, knowing something about students' existing understanding of a central course term or concept would seem to be important (if not essential) to ensuring a successful course outcome. Our project design and development as well as our research methods reflect this emphasis on pedagogical relevance.

The purpose of our research was twofold: to demonstrate the need for more research devoted expressly to students' understanding of the term "Critical Thinking" and to create a user-friendly instrument to help faculty across disciplines evaluate their student's definition of the same.

Our study found over 100 definitions of CT within a student sample of n=157. Students' definitions ranged widely both within a given classroom and across the larger student population as a whole. Our findings thus confirmed our initial hypothesis that there may be multiple understandings of/use of the term among our student population in a given classroom. Given this variation, it holds that if faculty members hope to teach, increase, or assesses "critical thinking", understanding students' definition of the term in a specific classroom is essential. Without such baseline knowledge faculty members are faced with a potential disconnect and either they or their students may be lost in translation.

To date, the instrument we created seems to meet faculty needs according to the small pilot study we carried out. Faculty respondents indicated high ease of use and potential for practical application in their classrooms. Our initial findings suggest that whether a faculty member uses this information to align students' understanding with his/her own, involves students in constructing a course-specific definition of CT, or simply uses the information to engage in a discussion about CT generally, there appears to be a perceived value in understanding students' understanding of CT.

In 2004 Petress claimed that scholars need to "better understand each other's use of the term; to better allow speakers, listeners, readers, and writers to better use this pervasive term in academic literature." (465). Yet despite Phillips and Bond's work and despite Petresses' clear directive for scholars to understand the complexity of the term "critical thinking" we believe that our small study is the first to explicitly listen to students as a way to "better understand" (a la Petress) an "other" heretofore silent in the literature. The result of more research like ours may be the creation of a literature that offers faculty members more and better tools for meeting their stated goals and objectives around CT. After all, only by identifying similarities and differences in the use of CT within any shared classroom space can we, as educators, clarify terms, highlight skills being taught, and effectively assess the same. Listening to the "other" (in this case students) is the first step in reflective and responsive teaching.

**Appendix A: I. FACULTY INSTRUCTION SHEET**

1) Read through all the words and phrases below
2) Circle the **ONE** word or phrase that BEST matches **YOUR** definition of "CRITICAL THINKING"

| |
|---|
| Coming up with a solution or conclusion |
| Offering and in depth answer |
| Answering questions |
| Finding the correct answer |
| Assessing what needs to be done |
| Analyzing |
| Getting beyond what is there |
| Brainstorming |
| Applying knowledge to situations |
| Breaking down information |
| Acting upon a situation |
| Staying focused on what you are doing |
| Asking questions |
| In depth thinking |
| Making a reasonable decision |
| Thinking outside the box |
| Different approaches and ways of thinking about an issue |
| Staying away from biased information |
| Something that helps to solve problems |

**Appendix B: II. STUDENT INSTRUCTION SHEET**

1) Read through all the words and phrases below
2) Circle the **ONE** word or phrase that BEST matches **YOUR** definition of "CRITICAL THINKING"

| |
|---|
| Coming up with a solution or conclusion |
| Offering and in depth answer |
| Answering questions |
| Finding the correct answer |
| Assessing what needs to be done |
| Analyzing |
| Getting beyond what is there |
| Brainstorming |
| Applying knowledge to situations |
| Breaking down information |
| Acting upon a situation |
| Staying focused on what you are doing |
| Asking questions |
| In depth thinking |
| Making a reasonable decision |
| Thinking outside the box |
| Different approaches and ways of thinking about an issue |
| Staying away from biased information |
| Something that helps to solve problems |

**Appendix C: III. SUMMARY KEY FOR FACULTY**

Instructions:

I. In the "MY Selection" column, put a check mark to the left of the word/phrase that YOU selected

II. As you review student selections, put a mark in the appropriate row/category for each student who circled an item in that particular category

III. Total each row (use "Final STUDENT Tally" column) to see the distribution of your class

Note: this key will help you determine the following:

- The number of students selecting each individual word/phrase & the resulting class distribution
- The similarity or disconnect between how you understand/define critical thinking and how your students understand/define it

| My Selection | | Final STUDENT Tally |
|---|---|---|
| | Coming up with a solution or conclusion | |
| | Offering and in depth answer | |
| | Answering questions | |
| | Finding the correct answer | |
| | Assessing what needs to be done | |
| | Analyzing | |
| | Getting beyond what is there | |
| | Brainstorming | |
| | Applying knowledge to situations | |
| | Breaking down information | |
| | Acting upon a situation | |
| | Staying focused on what you are doing | |
| | Asking questions | |
| | In depth thinking | |
| | Making a reasonable decision | |
| | Thinking outside the box | |
| | Different approaches and ways of thinking about an issue | |
| | Staying away from biased information | |
| | Something that helps to solve problems | |
| | Coming up with a solution or conclusion | |

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