

Identifying Faculty's Knowledge of Critical Thinking Concepts and Perceptions of Critical Thinking Instruction in Higher Education¹



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Abstract

This study was done to identify patterns in college of agriculture and life sciences faculty's understanding of basic critical thinking concepts and person perceptions of critical thinking instruction. The objectives of this study include, identifying patterns in faculty's knowledge of critical thinking concepts and identifying patterns in faculty's perceptions of critical thinking instruction in higher education. This quantitative study was performed to analyze patterns in responses of faculty participants. The participants included 61 self-selected faculty with teaching appointments in a college of agriculture and life sciences at a southern land grant institution. The data was collected using a compilation of three instruments: a critical thinking basic skills test, a "perceptions of critical thinking instruction" questionnaire, and a short demographic segment. The online data collection software, Qualtrics, was used to collect the data. The overall conclusion was that faculty's knowledge of perceptions and concepts of critical thinking is severely lacking. Not one question, in any section, was answered completely correctly. It is recommended that faculty participate in further education to understand the concepts of critical thinking.

Introduction and Theoretical Framework

Thinking is a natural process, but when left to itself, can often be biased, distorted, partial, uninformed and potentially prejudiced; excellence in thought must be cultivated (Duron et al., 2006). Students are able to think critically on their own, but this skill needs to be strengthened and reinforced by

teachers. Furthermore, the way material is presented has a large effect on whether or not critical thinking takes place. Most teachers use a lecture format in their classrooms, but this popular approach does not encourage critical thinking by the students (Duron et al., 2006). To encourage critical thinking, the passive receipt of information must change, teachers must give up the perception that students cannot learn unless a teacher covers the material (Choy and Cheah, 2009). This being said, it is important to consider how much influence a teacher's perception of critical thinking has on the student's ability to learn and think critically.

In 2004, higher education associations and leaders of institutional accrediting bodies decided that critical thinking was one of the six major intellectual and practical skills students should understand (AAC&U, 2004). However, Lauer (2005) claimed that, "teachers may not know how to incorporate critical thinking into their lessons." Yet, based on traditional methods, faculty lean too heavily on traditional lecture and PowerPoint; this may be the reason teachers have difficulty incorporating critical thinking into their classes. Research has shown that the nature of the discipline does not matter and that students have to learn to read deeper into topics and think critically about the knowledge given (Rhoades et al., 2008). Without the correct concepts and perceptions of critical thinking, the teacher may believe they are encouraging or teaching critical thinking when they are not. This study was developed to determine the extent of knowledge faculty members, with teaching positions, have about critical thinking, as well as their current perceptions about critical thinking instruction.

¹The University of Florida Institutional Review Board approved the study protocol and all participants provided written informed consent prior to participation in the study.

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Identifying Faculty's Knowledge

Critical thinking is defined by Facione (1990) as “purposeful, self-regulatory judgment, which results in interpretation, analysis, evaluation, and inference, as well as explanation of evidential, conceptual, methodological, criteriological, or contextual considerations upon which that judgment is based.” Another definition of critical thinking, in regards to agricultural education, is by Rudd et al. (2000), and states, “critical thinking was a reasoned, purposive, and introspective approach to solving problems or addressing questions with incomplete evidence and information and for which an incontrovertible solution is unlikely.”

Whittington and Newcomb (1993) found that although teachers have positive attitudes and aspirations to teach at higher, critically thinking levels, they may not actually be doing so. One reason behind this incongruence is that teachers may not understand how to teach at higher levels or even what strategies teaching at a higher level may include. Intentionality is the power of minds to be about, to represent, or to stand for, things, properties and states of affairs (Jacob, 2010). Intentionality comes into play with the idea that teachers may not teach what they do not think they can explain. Their intention may be to teach at a higher level, which would include critical thinking, when really, the perception of the knowledge they have of this subject is incomplete.

There is little information empirically established to determine not only the perception of faculty about critical thinking instruction, but also the actual knowledge faculty has about critical thinking concepts. This is an important step in beginning the process of determining a model of assisting faculty in providing the best quality critical thinking instruction in their classrooms.

Purpose and Objectives

The purpose of this research was to identify patterns in college of agriculture and life sciences faculty's understanding of basic critical thinking concepts and personal perceptions of critical thinking instruction.

The following objectives provided a foundation for the study and were to:

1. Identify patterns in faculty's knowledge of critical thinking concepts and
2. Identify patterns in faculty's perceptions of critical thinking instruction in higher education.

Methods

To accomplish the objectives and fulfill the purpose of the study a mixed-methods approach was utilized. Quantitative methods were used to collect

responses and qualitative, content analysis methods were used to analyze patterns in responses of faculty participants. The researchers determined that this approach was appropriate for this study, considering its developmental nature.

Responses, collected through an online assessment, were recorded for 61 self-selected faculty with teaching appointments within the college of agriculture and life sciences at a southern land grant institution. The participants were identified through email requests of faculty with teaching appointments. There is a total of 376 faculty with teaching appointments who represent 17 academic departments, with emphases in both social and bench sciences at the institution. Upon initial review of the data four responses were determined to be unusable, resulting in a total of 56 usable responses.

The assessment used in the study was a compilation of three instruments, a critical thinking basic skills test (Elder et al., 2007), a perceptions of critical thinking instruction questionnaire (revised from Choy and Cheah, 2009), and a short demographic segment. Using the Qualtrics online data collection software, the researcher set parameters for each section of the assessment.

The first segment was specifically designed to measure an individual's knowledge of basic critical thinking concepts as designed by Elder et al. (2007). The International Critical Thinking Basic Concepts and Understanding Test included three parts with a total of 26 questions. Part one, On the Nature of Critical Thinking, had ten true/false questions designed to gauge an individual's familiarity with specific critical thinking statements. The second part, On the Nature of Critical Thinking II, included six multiple-choice questions to determine the accuracy of an individual's knowledge of critical thinking. Part three, On Recognizing Important Distinctions in Critical Thinking, utilized a matching technique, whereby respondents had to match statements with terms related to critical thinking. There were a total of ten terms to match with six statements, including “none of the above.” Examples of questions are provided in Table 1. A key was provided to determine the accuracy of each response.

The second segment was revised from a list of questions first proposed by Choy and Cheah (2009). The original list contained eight open-ended questions to gauge faculty's perceptions of critical thinking and critical thinking instruction. The revised questionnaire was comprised of 15 Likert-type questions using a scale of 1 (Strongly Disagree) to 5 (Strongly Agree). The instrument, which was reviewed by content

Table 1. On the Nature of Critical Thinking

Statement	True	False
Critical thinking is useful only in Western Cultures (False)	1 (1.8%)	5 (98.2%)
As people grow older they naturally develop as critical thinkers (False)	18 (40%)	27 (60%)
Critical thinking is self-disciplined (True)	36 (80%)	9 (20%)
Critical thinking enables one to think more deeply	46 (82.1%)	9 (16.1%)
One should not analyze sympathetically points of view that are disgusting and obviously false (False)	3 (5.4%)	53 (94.6%)
If a statement is unclear we benefit by asking what our purpose is in saying it (True)	54 (96.4%)	1 (1.8%)
Implications are conclusions you come to in a situation (False)	18 (40%)	27 (60%)
Critical thinking is important in learning to read well (True)	40 (91%)	5 (9%)
Critical thinkers use subjective standards to assess thinking (False)	16 (35%)	29 (65%)
Critical thinkers learn to ignore their emotions when making important decisions (True)	24 (53%)	21 (47%)

experts for face validity, was analyzed using statistical software for internal reliability, as well. Questions included in this segment were analyzed and found to have a Cronbach's Alpha Coefficient of .70. This coefficient was determined sufficient due to the developmental nature of this segment as addressed by Penfield (2002).

Content analysis includes collecting data and using classifications to identify patterns and frequencies among the respondents. Concepts from each piece of the assessment were reviewed by the researchers for pattern in response and theme. Each concept was identified individually by the researchers and then discussed to determine consistency between the researchers. The questions of the assessment served as the codes in which patterns of responses were identified.

Findings of the content analysis are provided for each of the research objectives outlined for this study. Because of the developmental nature of the research, the findings are in no way intended to be generalized beyond those individuals participating in the study.

Findings

Objective 1

Objective 1 was to identify patterns in faculty's knowledge of critical thinking concepts. This was accomplished through a systematic review of individual responses on the 3-part International Critical Thinking Basic Concepts and Understanding Test (Elder et al., 2007).

The first section of the International Critical

Thinking Basic Concepts and Understanding Test included 10 true/false questions regarding "On the Nature of Critical Thinking." Of the ten questions, there was not a single question in which all respondents answered correctly; however, there were consistencies in which questions were answered among all respondents. The statements and responses are shown in Table 1.

There were 21 respondents who incorrectly answered false to the statement, "Critical thinkers learn to ignore their emotions when making important decisions." Similarly, 18 responded true to the statement, "Implications are conclusions you come to in a situation" which was incorrect. For the statement, "As people grow older they naturally develop as critical thinkers," 18 responded true when in fact the statement is false. Lastly, 16 respondents who believed "Critical thinkers use subjective standards to assess thinking" was a true statement when it is false.

In the next section of the assessment, there were a total of six questions to determine familiarity with critical thinking concepts when presented with alternative responses. Again, there was not a single question where the all respondents answered correctly; however, there were some general patterns in response. The statement, "It is important to clarify thinking whenever," had the most consistency in response with 50 respondents identifying correctly that the statement referred to all provided options ("You are explaining something to someone," "Whenever someone is explaining something to you," "You are analyzing an article or chapter"). The next question which had the least varying amount of response related, "Fair-minded thinking is" to "Integrally connected with intellectual empathy" where 40 of 54 respondents answered it correctly. The other respondents varied in answer. There were 40 of 53 respondents who answered, "Depth in reasoning best relates to" correctly with "All of the above" ("Complexities in the issue," "Logical interpretations," "Clarifying the issue").

The remaining two questions were answered with a larger degree of variation. There were 31 respondents who answered, "One main requirement of fair-minded critical thinking is" correctly as, "To analyze thinking into its most basic components." Yet, there were 16 who responded, "To identify every aspects of one's thinking." The last statement of this section, "Critical thinkers assess thinking in order to" had 26 respondents who answered correctly, "Determine what thinking to accept and what to reject;" however, 18 responded, "Take their thinking apart and examine it."

The third section of the basic concepts assessment

Identifying Faculty's Knowledge

analyzed respondents' ability to correctly identify the basis of critical thinking terms. Respondents were provided with six choices to relate to ten different terms. The idea that there are specific concepts identified as "An important obstacle to critical thinking" had the greatest number of correct responses. The following terms were correctly identified, "Close-mindedness" (50/50), "Self-deception" (44/48), "Distrust in reason" (40/50), and "Fixity of belief" (39/50). "Bias in thinking" also, "An important obstacle to critical thinking" was correctly identified by 37 of 50 respondents; however, nine identified the statement as, "A basic component of thinking that we need to identify in understanding the structure of thinking." "Point of view" a statement correctly identified as, "A basic component of thinking that we need to identify in understanding the structure of thinking" by 25 of 49 respondents was incorrectly identified 24 responses, with six respondents selecting either, "An important ability for thinkers to develop in learning to think critically" or "None of the above." Likewise, there were 11 of 49 respondents who identified "Math puzzles" as "An important ability for thinkers to develop in learning to think critically" when in reality it did not relate to any of the provided statements.

The last group of statements showed the greatest variability in answer by respondents. There were 23 of 51 respondents who identified, "Clarity" as "An important ability for thinkers to develop in learning to think critically," 11 who selected, "An important trait for thinkers to develop to become reasonable and fair," and 8 who selected, "A basic component of thinking that we need to identify in understanding the structure of thinking." The correct answer, "An important standard that helps us judge the worth of thinking" was only selected by nine participants.

The term "Liberalism" was correctly identified

by 22 respondents as "None of the above," yet, 12 responded "An important obstacle to critical thinking" and six "An important trait for thinkers to develop to become reasonable thinkers" with the two incorrect responses being in opposition to one another. The last concept, "Contrasting" was correctly identified by only one respondent, as "None of the above," with incorrect responses ranging from, "A basic component of thinking that we need to identify in understanding the structure of thinking" (11/47), to "An important trait for thinkers to develop to become reasonable and fair" (14/47), and "An important ability for thinkers to develop in learning to think critically" (20/47).

Researchers identified patterns existing specifically with the complexity of concepts related to critical thinking. In that, the more complex the concept the more likely a respondent would incorrectly identify the answer. Additionally, the more likely a concept was identified as congruent with beliefs, "Liberalism" the more likely they would identify with term with that mindset. Also, if a term could be defined or was associated with a variety of concepts like, "Clarity" the more difficulty respondents had in identifying it as associated with critical thinking.

Objective 2

The second objective of the study was set to identify patterns in faculty's perceptions of critical thinking instruction in higher education. Six statements showed respondents either "Agreed" or "Strongly Agreed" with its intent. These are summarized in Table 2. Eight individual statements indicated respondents showed a greater range of response, those are summarized in Table 3. One statement was split, but with the majority (38/51) "Agreeing" or "Strongly Agreeing" – "It is my responsibility to thoroughly cover all course material with students in order for them to learn the subject matter."

Patterns in responses for this section of the study

Table 2. Statements with "Agree" or "Strongly Agree"

Statement	Strongly Agree	Agree	Neither Agree or Disagree	Disagree	Strongly Disagree
Critical thinking engages students' higher order thinking (analysis, synthesis, and evaluation)	35 (69%)	16 (31%)	0	0	0
Critical thinking encourages students to become independent thinkers	33 (65%)	17 (33%)	1 (2%)	0	0
Critical thinking encourages students to become active learners	31 (62%)	19 (38%)	0	0	0
Critical thinking can be used to achieve better learning outcomes	31 (61%)	19 (37%)	1 (2%)	0	0
Critical thinking will allow students a better understanding of course topics	27 (53%)	22 (43%)	2 (4%)	0	0
I believe that it is my responsibility to promote critical thinking in my courses	20 (39%)	27 (53%)	4 (8%)	0	0

note 48 of 51 responses were usable

Table 3. Statements with Varying Responses

Statement	Strongly Agree	Agree	Neither Agree or Disagree	Disagree	Strongly Disagree
Critical thinking is a method of thinking which would help students enjoy the learning process	17 (34%)	23 (46%)	9 (18%)	1 (2%)	0
Critical thinking should always include a reflective component	18 (35%)	22 (43%)	8 (16%)	2 (4%)	1 (2%)
I am aware when students use critical thinking in my courses	7 (14%)	31 (61%)	12 (24%)	1 (2%)	0
I look for specific evidence of critical thinking by students in my courses	8 (16%)	28 (57%)	12 (24%)	1 (2%)	0
I have the skills necessary to promote critical thinking by students in my courses	7 (14%)	27 (53%)	11 (22%)	6 (12%)	0
I think that students have barriers to critical thinking, regardless of the strategies I use	8 (16%)	25 (49%)	12 (24%)	6 (12%)	0
If required, I could implement critical thinking into my courses	12 (24%)	27 (53%)	10 (20%)	2 (4%)	0
In order for me to fully implement critical thinking into my courses I would need additional support	8 (16%)	25 (50%)	10 (20%)	6 (12%)	1 (2%)

note 48 of 51 responses were usable

showed that participants held more favorable opinions on the statements which were most closely associated with student’s development of critical thinking. However, when the statement was focused more closely on the faculty member’s role in critical thinking instruction there was greater variance in response

Conclusions, Implications and Discussion

Based on the information in the findings section, faculty tested in this study are lacking knowledge about critical thinking. This reinforces Lauer’s (2005) statement purporting that faculty may not have all the tools necessary to incorporate critical thinking into their courses. When taking into consideration that none of the questions in the survey were answered correctly by all participants, one may believe that faculty need more instruction when it comes to critical thinking. In both objectives there were different consistencies in the answers. One statement in section one of objective one “Critical thinking enables one to think more deeply,” was answered false when it is actually true. Statements like this were often answered incorrectly. There are many reasons why this could happen. Faculty may have assumed that the answers were more difficult than they really were. Likewise, the perception of critical thinking is often different than what is actualized and this is reflected in Rhoades et al. (2008) comment that every teacher thinks they are teaching critical thinking. Another reason is that the study was not taken completely seriously. Finally, teachers may not have had formal education themselves when it comes to critical thinking.

When faculty do not understand critical thinking,

it is almost impossible for them to teach their students to think critically. It is important to teach students critical thinking skills so they can excel in education. Critical thinking is an important component to post-secondary education.

To address the problem of lack of knowledge by faculty, there are steps that can be taken to educate them. Osborne (2011) provided the challenge catalyzing the need to further investigate the extent to which faculty developmental interventions work in improving the teaching and learning process. With this baseline research, the conversation can continue to grow and seminars based on critical thinking instructional strategies may be developed. Encouraging faculty to include critical thinking components into their lectures will help educate both faculty and students about the value of critical thinking.

With this being said, the outcome of this study shows that faculty’s critical thinking knowledge is lacking. Future studies should further investigate critical thinking knowledge in faculty. Specific tests of faculty critical thinking disposition and skill will assist in determining how faculty are prepared to teach critical thinking, beyond what their current knowledge level is. Also determining the current strategies faculty are using to teach critical thinking in the classroom may assist with identifying the quality of critical thinking instruction. This paired with the perceptions of students about the strategies will give a much more robust picture of the state of critical thinking instruction in higher education.

As the needs of students change along with the needs of industry, so will the transferrable competencies that are taught. This initial look at critical thinking basic skill and current perceptions will allow for a

Identifying Faculty's Knowledge

more targeted approach when designing workshops and literature for critical thinking instruction. The better the teaching strategy, the better the outcome; understanding how to bridge these two ideas will determine the how successful faculty are at teaching important transferrable competencies.

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