Preliminary Report on Critical Thinking in the Core Curriculum at SHSU

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As part of its assessment of the critical thinking (CT) component of the Core Curriculum, our subcommittee attempted to gain insight as to how CT is defined, taught, and assessed in a subset of courses across campus. The rationale for this is related to the literature on CT which indicates that the definition of CT varies not only across disciplines, but from one individual to another. Further, a study of 140 faculty members in 38 public universities and 28 private universities in California in the 1990s, found that 89 percent of those interviewed stated that teaching critical thinking was one of their major objectives, yet only 19 percent could clearly define it. In addition, 75 percent made little or no reference to intellectual traits of mind (dispositions) associated with critical thinking, and 77 percent had little or no idea as to how to incorporate critical thinking into their teaching (Paul, Elder, & Bartell, 1997). Although this study was conducted in California in the mid-1990s, the results appear to be quite consistent with the results of more recent research.

The significance of this finding is that it is difficult to teach CT if the instructor, or program area, has no clear definition of CT. And, perhaps more pertinent from the standpoint of meeting the THECB goal of graduating students who can 'think critically', the definition and approach used in courses may, unfortunately, be limited to a small subset of the components that comprise CT, such as the ability to 'solve problems' or to think 'logically'. Indeed, the idea that CT consists largely of solving problems is common, though the nature of the 'problem' to be solved varies across disciplines. In Physics, chemistry and mathematics, it is typically associated with mathematical problem solving, whereas in the humanities and social sciences, it tends to focus on social or cultural problems. In criminal justice, it may focus on the problem of how best to apply laws to criminal investigations. However, such definitions, and the corresponding approaches to teaching CT, may not include the broad spectrum of abilities and dispositions which actually characterize critical thinking.

These characteristics have been described by many authors and are, by and large, encompassed by the definition provided in the American Philosophical Association's Statement of Expert Consensus on Critical Thinking, also known as the Delphi Report (Facione, 1990). The report was prepared under the auspices of the American Philosophical Association, and the group who prepared the report consisted of 46 members with expertise in the field of critical thinking. In part, the report's statement on critical thinking reads:

> "We understand critical thinking to be purposeful, self-regulatory judgment which results in interpretation, analysis, evaluation, and inference, as well as explanation

> of the evidential, conceptual, methodological, criteriological, or contextual considerations upon which that judgment is based . . . . The ideal critical thinker is habitually inquisitive, well-informed, trustful of reason, open-minded, flexible, fair minded in evaluation, honest in facing personal biases, prudent in making judgments, willing to reconsider, clear about issues, orderly in complex matters, diligent in seeking relevant information, reasonable in the selection of criteria . . . Thus, educating good critical thinkers . . . combines developing CT skills with nurturing those dispositions which consistently yield useful insights and which are the basis of a rational and democratic society."

Similarly, Valenzuela, Nieto, and Saiz (2011) state that critical thinking is deliberate, higher-order thinking that requires self-control and which encompasses such things as problem solving and the evaluation of hypotheses, arguments, conclusions, and beliefs. Most others in the field (e.g., Facione, 1990; Lai, 2011; Behar-Horenstein & Niu, 2011; Ellerton, 2015), also assert that it entails metacognition, i.e., the reflective evaluation of the thought processes by which we reach our conclusions (Valenzuela et al., 2011). It includes a deliberate attempt to avoid biases and logical fallacies that may interfere with drawing correct, fair-minded conclusions. Therefore, the disposition and ability to engage in metacognition is a necessary condition for critical thinking to occur.

Ennis (2011, p. 10) succinctly defines critical thinking as "reasonable, reflective thinking that is focused on deciding what to believe and do. Brookfield (2012) and others (e.g., Lai, 2011) also emphasize that the concept of critical thinking encompasses *ethical* thinking in that critical thinking is premised upon not only a desire to determine the truth, or correctness, of a claim but also the desire to ensure that "our assumptions are justifiable according to some notion of goodness or desirability (p. 17)."

Common to all of these definitions is that CT involves an understanding of evidence-based decision-making that requires logical reasoning and the use of metacognition/reflective thinking to avoid biases. They also include, either explicitly, or implicitly, the personal goal of arriving at either a correct conclusion (if the evidence is of such a nature as to allow for a definitive conclusion), or a reasonable, informed, fair-minded conclusion when it is not possible to determine *the* correct answer. This means that critical thinkers must not only have the skills to think critically, but must also have the disposition to do so, i.e., they must value truth/correctness and fair-mindedness, and they must also be willing to put in the effort to think critically. Accordingly, for SHSU to graduate students who can think critically, the spectrum of skills that comprise CT must be taught and the dispositions to think critically must be nurtured by showing

the value and relevance of using CT in daily life. While specific courses may necessarily emphasize some aspects of CT (such as problem solving) in lieu of others, it is necessary that, in combination, the courses which comprise the Core Curriculum encompass all aspects of CT if we want our students to become critical thinkers.

With this in as background, the subcommittee on CT requested information from instructors (via the Associate Deans) on the instructors' definitions and approaches to teaching CT. Specifically, the following four questions were asked:

1) Name of your course and course prefix and number (not section).

2) How do you define (perceive) critical thinking as it relates to your efforts to teach critical thinking?

3) How do you attempt to teach critical thinking?

4) How do you assess it and how do you know whether your students are developing their CT ability?

We had hoped to obtain 10 responses from each of the seven colleges – or about 70 responses. However, we received only 26 responses. In terms of the disciplines represented, the responses did span many of the departments and colleges in the university, including the departments of Agriculture, Business, Biology, Chemistry, Criminal Justice, Family and Consumer Sciences, Geography, Kinesiology, Mathematics (includes course for education majors), Mass Communication, Music, and Physics. The results are provided in Table 1: Elements of Definitions of CT, Table 2: Methods of Teaching CT, and Table 3: Methods of Assessing CT.

The elements listed in Table 1 are based on the elements and dispositions of CT identified in the above discussion – as well as some that were stated by instructors. To address the range of responses based on the specific wording used in the responses, it was necessary to group some of them together based on a common theme implied by the responses. Clearly, there is some subjectivity involved in these groupings, and others might prefer a different grouping. However, the goal was to determine if the elements of critical thinking, and dispositions to think critically, were being addressed in the courses, rather than to make nuanced distinctions. In addition, some responses specifically stated (S) the elements directly, whereas other strongly implied (I) that they were using an element in their definition, even if it was not stated correctly. Also, some instructors cited definitions from the literature on CT, rather than provide their own definitions. In the latter case, the letter D was indicated to reflect this.

Lastly, it could probably be assumed that some items apply to all courses (e.g., that the instructors grade the assignments and/or provide feedback; or that the goal of CT is to arrive at truth/correctness); but, if this was not stated specifically it may not have been indicated on the Table. In the former instance (grading), it may be the case that some assignments are not formally graded and so this was not assumed. As regards the "valuing truth or correctness", this refers more to *disposition to seek and value truth*, which is qualitatively different from simply wanting to obtain a correct answer in order to obtain maximum points on an exam or assignment.

As shown in Table 1, the most common element of CT identified was related to problem solving, which includes the application of knowledge to address problems. This was stated directly, or implied, in 17 of the 26 responses. The second and third most commonly cited elements were related to evaluation (10), and both analysis and argument (8). Metacognition, which includes the avoidance of bias and use of self-regulation of thought processes, was cited by 7; i.e., by less than a third of the respondents. Only two instructors specifically mentioned valuing or seeking truth/valuing correctness and only one course included reference to ethical thinking. *(*The valuing of ethical choices/conduct was not specifically mentioned, but based on personal knowledge of the course, this is a theme woven throughout it and specifically addressed in it. This same course also emphasizes relevance to social issues; e.g. climate change and vaccinations.*) As mentioned above, one could reasonably assume that, if one is trying to solve a problem, then one values truth/correctness. However, as implied in the Delphi definition and others, CT goes beyond this idea of a correct answer to a problem (such as in math) to a much broader and more salient appreciation for truth/correctness/reasonableness in general, and it was not clear this was the goal of the other courses.

The methods of Teaching CT, shown in Table 2, show that discussion, whether in face-to-face groups or online, was, by far, the most commonly used method to teach CT. Eleven of the respondents used this approach. The second most commonly used method was some form of application of the concepts taught in class to address real-world problems (8). In five cases, in-class group work is done, and in three cases, *assignments* or *active learning* were mentioned. In the latter case, not enough information was provided to indicate the nature of those assignments as they relate to the teaching of CT.

As is evident, it is not only a challenge to define CT, but it is perhaps even more difficult to teach it directly. This, of course, relates to the definition of CT one uses, which necessarily informs the method used to teach it.

Table 3 shows the methods of assessment used by instructors and, as one would expect, exams and quizzes were the dominant method used (16). Term papers and writing assignments (presumably with feedback from the instructor) were used by 6 respondents – though again, it may be the case that other courses listed also use writing, but did not specifically state this. Informal questioning and listening to provide informal feedback was also cited by 4. However, it was not clear whether these were graded, in which case, this might be considered more of an instructional method rather than an assessment method, as there is no quantitative evaluation of the student's CT ability using an ungraded approach. Only one course specifically cited the use of instruments specifically designed to measure CT, though one cited a CT rubric. Four instructors specifically mentioned the use of a rubric to evaluate an assignment or performance.

Conclusions:

Clearly, it is a challenge to assess CT, because of the difficulty of mapping the assessment onto the definition used by an instructor. Accordingly, it is not always clear whether or not an instrument, assignment, activity, etc. that is used actually measures CT – and this highlights the difficulty of trying to quantify CT ability. The task of both teaching and assessing CT is inherently difficult.

Having said this, the literature on CT, as well as the results of this very informal, limited survey of courses at SHSU, suggest that the first step to teaching CT is to define it as specifically as possible. The definition will help guide the process of teaching it. The research shows that CT concepts must be taught specifically; i.e., it cannot be assumed that an instructor's lecture will model CT in such a way that students will learn it. In fact, the literature shows that this does not occur. According to the literature, one of the most effective ways to teach CT entails a specific introduction to the elements of CT (e.g., definitions of an *argumen*t, valid and sound arguments, strong vs. weak arguments, logical fallacies and forms of bias, metacognition, the importance of evidence, the difference between fact and opinion, and the value of CT in daily life, etc.). With an understanding of these concepts, students can then apply them within the context of their specific course or discipline using real-world or hypothetical examples (Rowe et al., 2015). In short, the literature indicates that CT concepts must be specifically referenced when teaching. Finally, the use of group work/active learning significantly enhances the CT ability of students, which is undoubtedly why it was referenced by some of the instructors.

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