# Defining Critical Thinking

By Rick D. Rudd

## Critical thinking is a skill

that most teachers would readily agree is important for students to develop. Unfortunately, many of our students have poorly developed critical thinking skills. Perhaps the problem is rooted in those who teach. Do teachers in career and technical education (CTE) understand the concept of critical thinking well enough to teach students to think critically in and about the discipline being studied? Good thinking skills will not develop on their own, they must be taught. Teaching thinking skills is a difficult endeavor. Teaching to promote thinking takes much time to prepare, is difficult to plan, and limits the amount of content "taught." Teachers can no longer be information givers. On the other hand, students must learn thinking and reasoning skills to reach their fullest potential in today's society. If we are to prepare students for entry and advancement in careers through CTE, we must commit to developing problem solving and decision making through teaching critical thinking skills and developing the dispositions necessary to think critically.

The "more information is better" attitude tends to prevail in modern education. That is unfortunate considering that factual material taught has a relatively short lifespan (Terezini, Springer, Pascarella, and Nora, 1993). The term critical thinking is common in educational, psychological and philosophical circles today. Employers, parents and administrators want critical thinking skills in today's graduate. Developing critical thinking skills is not a new idea. Osborne (1932 p.402) stated that "...it is assumed that development of thought power is one of the major aims of education." Dressel and Mayhew (1954) believed that educational institutions were responsible for teaching students to go beyond the simple mental activities of recall and restatement of ideas and facts to the higher level skills and habits involved in critical thinking. Sutton and de Oliveira (1995) asserted that although students complete basic courses, they have only a superficial understanding of what they have learned. In fact, few students are taught the skills needed to examine principles, values and facts.

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## Purpose, Methods and Procedures

The purpose of this article is to clarify the concept of critical thinking for career and technical educators. In an effort to clarify the concept of critical thinking the author has been engaged in critical thinking research for 12 years and offers his view of critical thinking based on literature in education, philosophy and psychology. In the descriptive and interpretive discussion that follows, the author attempts to present multiple views of critical thinking and to propose defining critical thinking and establishing a point to begin further research into teaching for thinking in CTE.

## Critical Thinking Defined

To date, much work has been completed in multiple disciplines in the name of critical thinking. A great deal of this work not only leaves one wondering how it is measured, but also leaves one groping for a clear definition of critical thinking. Paul (1995) wrote that the "master of critical thinking" uses a set of intellectual standards while thinking. These standards guide the thinking process as well as help individuals heighten their ability to think critically. Thinking about thinking for the purpose of improving the thought process is at the heart of critical thinking (Paul, 1995).

Halpern (1996 p.5) defined critical thinking as "...the use of cognitive skills or strategies that increase the probability of a desirable outcome." Other definitions include: the formation of logical inferences (Simon and Kaplan, 1989); developing careful and logical reasoning (Stahl & Stahl, 1991); deciding what action to take or what to believe through reasonable reflective thinking (Ennis, 1991), and purposeful determination of whether to accept, reject or suspend judgment (Moore and Parker, 1994). Burden and Byrd (1994) categorize critical thinking as a higher order thinking activity that requires a set of cognitive skills. In a comprehensive attempt to define critical thinking, Pascarella and Terezini (1991) compiled the following:

"...critical thinking has been defined and measured in a number of ways but typically involves the individual's ability to do some or all of the following: identify central issues and assumptions in an argument, recognize important relationships, make correct inferences from data, deduce conclusions from information or data provided, interpret whether conclusions are warranted on the basis of the data given, and evaluate evidence or authority," (p. 118).

Crunkilton (1996) presented a pragmatic approach to promoting critical thinking in students through conditions necessary for thinking. The first condition is having something to think about such as a person, an object, a situation, problem or process. Crunkilton's second condition is having something to think with, such as background knowledge and resources (maps,

charts, notes, computers). The third condition is having ways in which to think. In other words, students need thinking structures to guide the thinking process. Examples include comparing, estimating, evaluating, problem solving and interpreting. The final condition is a reason to think. Reasons to think vary from thinking to resolve a controversy, to solving a problem, to satisfying an interest, or completing an assigned task.

Some clarity in defining critical thinking was achieved when a group of leading researchers with expertise in the field was asked to define critical thinking through a Delphi study in 1990 (Facione). They hypothesized that there is a set of intellectual virtues or habits of mind that reflect one's disposition to think critically. These virtues are identified in the Delphi consensus statement:

"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 judgements, willing to reconsider, clear about issues, orderly in complex matters, diligent in seeking relevant information, reasonable in the selection of criteria, focused in inquiry, and persistent in seeking results which are as precise as the subject and the circumstances of inquiry permit."

Rudd, Baker and Hoover (2000) defined critical thinking as, "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." In light of this discussion and in an attempt to synthesize the multiple definitions of critical thinking, the author offers the following definition: Critical thinking is reasoned, purposive and reflective thinking used to make decisions, solve problems and master concepts.

## Critical Thinking Traits and Processes

According to Facione (1990), critical thinkers possess a set of affective dispositions that enable them to seek to address situations that require critical thinking. Although a person can have the cognitive skills to think critically, they are more effective thinkers if they exhibit the affective dispositions listed in Table 1.

In an effort to clarify the process of critical thinking, Paul (1995) wrote that critical thinking is a unique and purposeful form of thinking that is practiced systematically and purposefully. The thinker imposes standards and criteria on the thinking process and uses them to construct thinking. Table 2 summarizes Paul's operational definition of critical thinking.

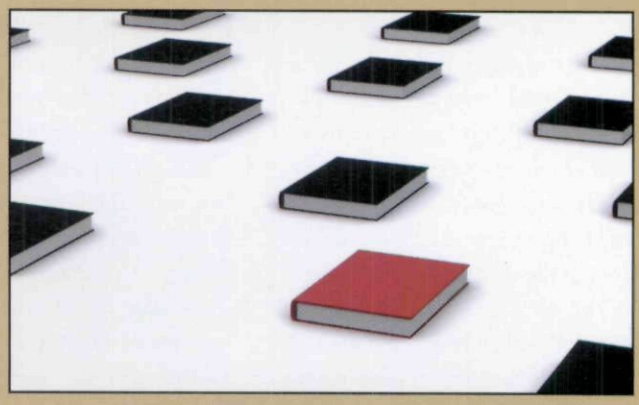
Paul further refined critical thinking by identifying three thought traits and/or processes possessed by the critical thinker. They are elements of reasoning, traits of reasoning, and reasoning standards. Elements of reasoning consist of seven components that help guide the reasoning process. These components include the purpose of the thinking or the question at hand, information and/or facts about the question, assumptions made about

**Table 1**

### AFFECTIVE DISPOSITIONS OF CRITICAL THINKING

#### APPROACHES TO LIFE IN GENERAL

- Inquisitiveness with regard to a wide range of issues.
- Concern to become and remain well-informed.
- Alertness to opportunities to use critical thinking.
- Trust in the process of reasoned inquiry.
- Self-confidence in one's ability to reason.
- Open-mindedness regarding divergent views.
- Flexibility in considering alternatives and opinions.
- Understanding of the opinions of others.
- Fair-mindedness in appraising reasoning.
- Honesty in facing one's own biases, prejudices, stereotypes, egocentric and sociocentric tendencies.
- Prudence in suspending, making or altering judgments.
- Willingness to reconsider and revise views where honest reflection suggests change is warranted.



#### APPROACHES TO SPECIFIC ISSUES, QUESTIONS OR PROBLEMS

- Clarity in stating the question or concern.
- Orderliness in working with complexity.
- Diligence in seeking relevant information.
- Reasonableness in selecting and applying criteria.
- Care in focusing attention on the concern at hand.
- Persistence though difficulties are encountered.
- Precision to the degree permitted by the subject and the circumstances.

Table 2

## WHAT IS CRITICAL THINKING?

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|---|---|
| **A unique kind of purposeful thinking** | In any subject area or topic, whether academic or practical, requiring intellectual training for the mind, akin to physical training for the body. |
| **The thinker systematically and habitually shows** | Actively develops traits such as intellectual integrity, intellectual humility, fair-mindedness, intellectual empathy, and intellectual courage. |
| **Imposes criteria and intellectual standards upon the thinking** | Identifies the criteria of solid reasoning, such as precision, relevance, depth, accuracy, sufficiency, and establishes clear standards by which the effectiveness of the thinking will be assessed. |
| **Taking charge of the construction of thinking** | Awareness of elements of thought such as assumptions and points of view that are present in all well-reasoned thinking. A conscious, active and disciplined effort to address each element is displayed. |
| **Guiding the construction of the thinking according to the standards** | Continually assessing the course of construction during the process. Adjusting, adapting and improving using criteria and standards. |
| **Assessing the effectiveness of the thinking according to the purpose, criteria and standards** | Deliberately assessing the thinking to determine its strengths and limitations according to the defining purpose, criteria and standards. Studying the implications for further thinking and improvement. |

the question, interpretation of the facts and data collected, theories and concepts related to the question, and inclusion of other points of view. Finally, an assessment of the conclusions is drawn with emphasis on implications and consequences of the decisions reached as a result of the thinking process (Figure 1).

Traits of critical thinkers include independent thinking, intellectual empathy, intellectual humility, courage, integrity, perseverance, intellectual curiosity, faith in reason, intellectual civility and intellectual responsibility. These traits are not only present in critical thinkers, they are consciously utilized to guide the thinking process (Paul, 1995). Standards that guide thinking include clarity in the thought process; accurate, precise and relevant thinking, utilizing information that is directly related to the thinking situation; deep thinking; and broad thinking. These standards can guide the critical thinker to a thinking product or decision that is not clouded by irrelevant information and has been investigated fully. Although thinking critically utilizes higher order thinking, critical thinking and higher order thinking are not equivalent terms. Critical thinking is not a "catch-all" category for higher order thinking. It is one of a family of closely related forms of higher order thinking. Others include problem solving, creative thinking, and decision making (Facione, 1990). The skills and sub-skills identified by the Delphi group are listed in Table 3.

Facione (1990) used the information from the Delphi study to identify seven constructs of critical thinking. These constructs include analyticity, self-confidence, inquisitiveness, maturity, open-mindedness, systematicity, and truth-seeking. Rudd, Irani, Ricketts, Friedel, and Rhoades (2007) further refined the constructs identified by Facione to include three critical thinking dispositions. The dispositions of engagement, cognitive maturity, and innovativeness can be used to describe a learner's disposition toward thinking critically.

*Engagement*: the engagement disposition describes an individual's ability to anticipate situations where they can exercise reasoning and judgment. People with high disposition in engagement enjoy solving problems, are confident in their ability to reason, and are able to explain their reasoning process to others.

*Cognitive Maturity*: People with more developed cognitive maturity are aware of their own biases and predispositions that affect decision making and reasoning. Cognitively mature individuals are comfortable with differences of opinion and listen to what others have to say with an open mind. They are willing to alter their position in light of compelling evidence.

Innovativeness: Innovative people are

always looking for opportunities to learn more. New knowledge, insights and innovations that improve their life are highly valued. People who are innovative are intellectually curious and ask questions to clarify and learn.

## Implications

Individuals who can think critically are invaluable as employees, leaders and members of society. Increasing the number and quality of critical thinkers in CTE will be a great asset to industry. Professionals who engage students in CTE are challenged with teaching students to think critically and make professional decisions that reflect good reasoning. The purpose of this article is to clarify the concept of critical thinking for career and technical educators. The literature cited and concepts discussed can provide a starting point for career and technical educators to integrate critical thinking skills into instruction. T

Figure 1

ELEMENTS OF REASONING

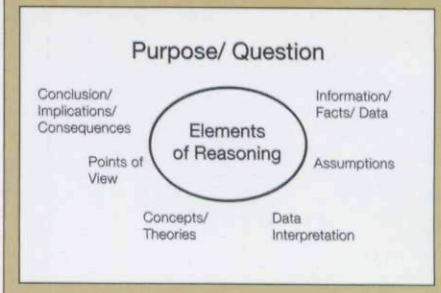


Table 3

CONSENSUS LIST OF CRITICAL THINKING

COGNITIVE SKILLS AND SUB-SKILLS

**Interpretation**
Categorization
Decoding Significance
Clarifying Meaning

**Analysis**
Examining Ideas
Identifying Arguments
Analyzing Arguments

**Evaluation**
Assessing Claims
Assessing Arguments

**Inference**
Querying Evidence
Conjecturing Alternatives
Drawing Conclusions

**Explanation**
Stating Results
Justifying Procedures
Presenting Arguments

**Self-Regulation**
Self-Examination
Self-Correction

*(Facione, 1990)*

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