

Critical Thinking Strategies Guide

Bloom (Bloom, Englehart, Furst, Hill & Krathwohl, 1956) developed a classification of levels of intellectual behavior in learning. This taxonomy contained three domains: the cognitive, psychomotor, and affective. Within the cognitive domain, Bloom identified six levels: knowledge, comprehension, application, analysis, synthesis, and evaluation. This domain and all levels are still useful today in developing the critical thinking skills of students. Teaching critical thinking skills is one of the greatest challenges facing teachers in the classroom today. The most widely used model for the development of higher level thinking skills is Bloom's Taxonomy.

Students must be guided to become producers of knowledge. An essential instructional task of the teacher is to design activities or to create an environment that allows students opportunities to engage in higher-order thinking (Queensland Department of Education, 2002). With the *Critical Thinking Strategies Guide*, the teacher can incorporate all levels of the taxonomy to plan questions and learning activities in every subject area. This resource allows a teacher to individualize learning according to the interests, abilities, and specific learning needs present in the differentiated classroom, from special needs students to students in gifted education. There are a number of independent and collaborative activities where students can become active participants while acquiring and applying critical thinking.

The *Critical Thinking Strategies Guide* also supports the differing learning styles within a classroom. Students learn and excel when provided multiple, varied opportunities. A classroom that offers an array of learning experiences increases the likelihood of success for more students (Gardner, 1983; Dunn and Dunn, 1978). Studies involving multi-sensory teaching experiences show students achieve more gains in learning than when taught with a single approach, whether it is a visual or an auditory approach (Farkas, 2003; Maal, 2004). Multi-sensory instruction or a combination of approaches appears to create the optimal learning setting, even for students with disabilities (Clark and Uhry, 1995). The variety in formats for students to demonstrate their learning has the potential to improve student interest, increase student interaction, and extend classroom learning. This educational tool contributes to the creation of a powerful learning environment by allowing students to be active participants and take more responsibility in their own learning.

Critical thinking is cited as an important issue in education today. Attention is focused on good thinking as an important element of life success (Huitt, 1998; Thomas and Smoot, 1994). "Perhaps most importantly in today's information age, thinking skills are viewed as crucial for educated persons to cope with a rapidly changing world. Many educators believe that specific knowledge will not be as important to tomorrow's workers and citizens as the ability to learn and make sense of new information" (Gough, 1991).

The ability to engage in careful, reflective thought is viewed in education as paramount. Teaching students to become skilled thinkers is a goal of education. Students must be able to acquire and process information since the world is changing so quickly. Some studies purport that students exhibit an insufficient level of skill in critical or creative thinking. In his review of research on critical thinking, Norris (1985) surmised that students' critical thinking abilities are not widespread.

Most students do not score well on tests that measure ability to recognize assumptions, evaluate controversy, and scrutinize inferences.

Thus, students' performances on measures of higher-order thinking ability reveal a critical need for students to develop the skills and attitudes of effective thinking. Furthermore, another reason that supports the need for incorporating thinking skills activities is the fact that educators appear to be in general agreement that it is possible to increase students' creative and critical thinking capacities through instruction and practice. Presseisen (1986) asserts the basic premise is that students can learn to think better if schools teach them how to think. Adu-Febiri (2002) agrees that thinking can be learned. The *Critical Thinking Strategies Guide* encourages teachers to actually teach students how to think rather than provide them with content knowledge alone.

Research indicates that thinking skills instruction makes a positive difference in the achievement levels of students. Studies that reflect achievement over time show that learning gains can be accelerated. These results indicate that the teaching of thinking skills can enhance the academic achievement of participating students (Bass and Perkins, 1984; Bransford, 1986; Freseman, 1990; Kagan, 1988; Matthews, 1989; Nickerson, 1984). Critical thinking is a complex activity and we should not expect one method of instruction to prove sufficient for developing each of its component parts. Carr (1990) acknowledges that while it is possible to teach critical thinking and its components as separate skills, they are developed and used best when learned in connection with content knowledge. To develop competency in critical thinking, students must use these skills across the disciplines or the skills could simply decline and disappear. Teachers should expect students to use these skills in every class and evaluate their skills accordingly. Hummel and Huitt (1994) stated, "What you measure is what you get." The assessment section in the *Critical Thinking Strategies Guide* suggest varied assessment tools to measure the progress of critical thinking in students.

Students are not likely to develop these complex skills or to improve their critical thinking if educators fail to establish definite expectations and measure those expectations with some type of assessment. Assessments (e.g., tests, demonstrations, exercises, panel discussions) that target higher-level thinking skills could lead teachers to teach content at those levels, and students, according to Redfield and Rousseau (1981), to perform at those levels. Students not only need to know an enormous amount of facts, concepts, and principles, they also must be able to effectively process knowledge in a variety of increasingly complex ways. The *Critical Thinking Strategies Guide* suggests numerous strategies and activities that engage the learner in processing knowledge at each level of thinking. The questioning stems and strategies in this valuable teacher resource can be used to plan daily instruction as students explore content and gather knowledge; they can be used as periodic checkpoints for understanding; they can be used as a practice review; or they could be used as ongoing assessment tools as teachers gather formative and summative data.

Teachers play a key role in promoting critical thinking between and among students. Questioning stems in the content areas act as communication tools. Four forms of communication are affected in critical thinking: speaking, listening, reading, and writing. The *Critical Thinking Strategies Guide* contains a wide range of stems and strategies to encourage students to think critically which contributes to their

intellectual growth. This educational resource relates to any content that is presented to students and saves teachers activity preparation time. A teacher must examine what he/she fully intends to achieve from the lesson and then select the appropriate critical thinking stem(s) to complement the instructional purpose or the cognitive level of thinking. The questioning stem itself influences the level of thinking or determines the depth of thinking that occurs.

Solving problems in the real world and making worthwhile decisions is valued in our rapidly changing environment today. Paul (1985) points out that "thinking is not driven by answers but by questions." The driving forces in the thinking process are the questions. When a student needs to think through an idea or issue or to rethink anything, questions must be asked to stimulate thought. When answers are given, sometimes thinking stops completely. When an answer generates another question then thought continues.

Teachers need to ask questions and design learning experiences to turn on students' intellectual thinking engines. Students can generate questions from teachers' questions to get their thinking to move forward. Thinking is of no use unless it goes somewhere, and again, the questions asked or the activities selected to engage students in learning determine the direction of their thinking. While students are learning, the teacher could ask questions to draw meaning from the content. The higher-order stems contained in the *Critical Thinking Strategies Guide* (analysis, synthesis, and evaluation) drive students' thinking to a deeper level and lead students to deal with complexity, rather than just search through text to find an answer.

Questions lead to understanding. Many students typically have no questions. They might sit in silence with their minds inactive as well. Sometimes the questions students have tend to be shallow and nebulous which might demonstrate that they are not thinking through the content they are expected to be learning. If we, as educators, want students to think, we must stimulate and cultivate thinking with questions (Paul, 1990). By engaging students in a variety of questioning that relates to the idea or content being studied, students develop and apply critical thinking skills. Consequently, by using the analysis, synthesis, and evaluation levels, students are challenged to work at tasks that are more demanding and thought-provoking. These kinds of tasks result in students making real-life connections.

Teachers need to plan for the type of cognitive processing they wish to foster and then design learning environments and experiences accordingly. Studies suggest that the classroom environment can be arranged to be conducive to high-level thinking. The findings include the following: an environment free from threats, multi-level materials, acceptance of diversity, flexible grouping, the teacher as a co-learner, and a nurturing atmosphere. A climate which promotes psychological safety and one in which students respect each other and their ideas appears to be the most beneficial (Klenz, 1987; Marzano, Brandt, Hughes, Jones, Presseisen, Rankin, and Suhor, 1988). Sometimes it is necessary to lecture. Other times, the teacher balances methods of instruction by providing opportunities for the students to take some ownership of their learning. Lovelace (2005) concluded that matching a student's learning style with the instruction can improve academic achievement and student attitudes toward learning. Various learning styles or activities that focus on the strengths of how students best learn need to be addressed in the classroom. The *Critical Thinking Strategies Guide* offers suggested strategies establish a thinking-

centered environment. In addition, there are stems identified that allow students to demonstrate learning and thinking using visual, auditory, or tactile/kinesthetic modes. The range of activities or tasks run the gamut from creative opportunities (writing a poem, composing a song, designing an advertisement, constructing a model) to participating in a panel discussion, presenting a speech, conducting a survey, holding an interview, using a graphic organizer, or simply compiling a list.

"Multiple forms of student engagement exist when high-level thinking is fostered. Examples of engagement include: collaborative group activities, problem-solving experiences, open-ended questions that encourage divergent thinking, activities that promote the multiple intelligences and recognize learning styles, and activities in which both genders participate freely. Brain researchers suggest teachers use a variety of higher-order questions in a supportive environment to strengthen the brain" (Cardellichio and Field, 1997). "Meaningful learning requires teachers to change their role from sage to guide, from giver to collaborator, from instructor to instigator" (Ó Murchú, 2003). "Since students learn from thinking about what they are doing, the teacher's role becomes one who stimulates and supports activities that engage learners in critical thinking" (Bhattacharya, 2002). The *Critical Thinking Strategies Guide* represents such findings as the above.

All teachers can develop questions and learning activities at various times that span the levels of Bloom's Taxonomy. The difficult part is to address each level in the same lesson, although it is not necessary to do this in every lesson. The main point is that teachers help students advance beyond simple repetition to self-regulated learning. Students are not empty vessels waiting to be filled with information. The intent of the *Critical Thinking Strategies Guide* is for students to take an active role in learning as they locate, organize, synthesize, evaluate, and present information, transforming it into knowledge in the process. Students can work independently or collaboratively with classmates to explore a problem. This makes it possible for each student to come to his or her own understanding of a particular topic as he or she constructs knowledge. This type of environment is focused on learning and is more student-centered than the traditional classroom. Strategies in this critical thinking guide assist teachers in developing a climate conducive to critical and creative thinking.

If the classroom becomes more student-centered, then what does this mean for the teacher? Is he or she no longer necessary? The role of the teacher is just as important as it has always been, perhaps more so. With an understanding of learning styles and of Bloom's Taxonomy, the teacher works with the students. Teachers scaffold learning so that students can assume a more participatory role in their own learning. This means that lessons are in fact more carefully constructed to guide students through the exploration of content using Bloom's Taxonomy. Attention to Bloom's Taxonomy does not mean that every class period must be optimally designed to place students in inquiry-based roles. Teaching requires that we constantly assess where students are and how best to address their needs.

"Recognizing that there are different levels of thinking behaviors important to learning, Benjamin Bloom and his colleagues developed Bloom's Taxonomy, a common structure for categorizing questions and designing instruction. The taxonomy is divided into six levels, from basic factual recall, or Knowledge, to the highest order, Evaluation, which assesses value or asks the teacher or learner to make judgments among ideas. In the 1950s, Bloom found that 95% of the test

questions developed to assess student learning required them only to think at the lowest level of learning, the recall of information" (Hobgood, Thibault and Walbert, 2005). Today, a considerable amount of attention is given to students' abilities to think critically about what they do. Leaders in various businesses, medical fields, and other professions have voiced their concern that schools are not preparing students to be critical thinkers. Having knowledge of the procedure for CPR, how to estimate expenses, or being able to calculate elapsed time is no longer enough.

These skills have little value without the ability to know how, when, and where to apply them. The utilization of the *Critical Thinking Strategies Guide* provides direction to teachers as they apply the levels of Bloom's Taxonomy and strengthen the abilities of students to think at higher levels. By using this critical thinking guide as a planning tool for high-quality instruction, the teacher can structure learning experiences to promote complexity of thought as well as teaching students how to learn as opposed to simply what to learn.

The No Child Left Behind Act of 2001 emphasizes the need for evidence-based materials. The Mentoring Minds Product Development team sought to develop a tool that teachers could use to develop students who value knowledge and learning. The development of the *Critical Thinking Strategies Guide* incorporates evidence-based findings about teaching and learning. Critical and creative questioning stems are identified in the content areas of Mathematics, Reading/Writing, Science, and Social Studies. Such stems guide students in finding solutions and answers rather than simply using memorization. This flip chart provides ideas for establishing a thinking-centered classroom and contains multiple strategies to encourage, develop, extend, and assess critical and creative thinking in students. This critical thinking resource will help foster critical thinking skills that lead to greater comprehension for all students using the original and revised Bloom's Taxonomy (Anderson, et.al, 2001).

Mentoring Minds' *Critical Thinking Strategies Guide* is based on the six levels of Bloom's Taxonomy. Studies over the last 40 years have confirmed Bloom's Taxonomy of the Cognitive Domain as a framework to establish intellectual and educational outcomes. The conclusions reached by researchers substantiate the fact that students achieve more when they manipulate topics at the higher levels of Bloom's Taxonomy. Our goal at Mentoring Minds is to support educators in their endeavors to help students acquire life-long skills of becoming independent thinkers and problem solvers.

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