

# Online Critical Thinking in Problem–Solving Groups

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## INTRODUCTION

There are many different definitions of critical thinking (CT). Some type of the concept is taught in all higher education disciplines. Academia teaches teamwork and critical thinking (Cathcart & Samovar, 1992) because the professional world requires small-group decision making (Jonassen & Kwon, 2001). Critical thinking is taught by precept and practice (Facione, 1995; Wilkinson, 2001; Winningham, 2000). Constructivists recommend dialogue because meaningful discussion enhances experiential learning through social negotiations and reflection (Vrasidas & McIsaac, 1999). Collaborative problem solving is often utilized in nursing education to increase critical thinking (Collis, Andernach, & Van Diepen, 1997; Cragg, 1991; Crooks, Klein, Savenye, & Leader, 1998; Krothe, Pappas, & Adair, 1996).

Nurse educators seek to enhance clinical decision making (Benner, 1995) because quality of thinking is directly related to patient outcomes. How a nurse thinks may mean the difference between life and death. Although the topic is vitally important, various disciplines define the concept in many ways. No one definition of critical thinking is accepted by all nurses. The reason is because nurses use a clinical decision-making process combining logical processing, diagnosis, priority setting, and creativity that differs according to specialized patient-care tasks performed.

## Collaborative Learning

Nursing educators utilize group activities to increase teamwork as well as problem-solving skills (Collis et al., 1997; Cragg, 1991; Crooks et al., 1998; Krothe et al., 1996). Learning is contextually situated in words

according to Brown, Collins, and Duguid (1998) because activity, concept, and culture are interdependent. Group work requires collective learning, the practice of multiple roles, evaluation of ineffective strategies and misconceptions, and performance of collaborative work skills. Collaborative groups involve several forms of critical thinking.

## CRITICAL-THINKING DEFINITIONS

Characteristics of critical thinking include the ability to reason, deduce, and induce based upon current research and practice findings. Additional characteristics include being insightful, inquisitive, and proactive. The critical thinker is also organized, assesses systematically and purposefully, and draws valid conclusions based upon presented evidence (Facione, 1995). Thinkers reflect on personal ideals and values, employing an intentional, purposeful, and goal-directed system. Critical thinkers set priorities by weighing risks and benefits, identifying alternatives, reaching decisions, evaluating their decisions, seeking feedback, and communicating.

The many definitions of critical thinking appear to be necessary to meet the demands of various professions. Some definitions stress logic, others reflection, others rationality, and still others creativity (Appendix A). The definitions suggest the sort of framework needed for guiding thinking. Some emphasize personal process while others suggest a checklist approach to the evaluation of arguments.

Molinari, Abegglen, and Mills (1999) posit a grand definition in order to understand how critical thinking applies to all professions: “[C]ritical thinking is the dynamic blending of perceptive, affective, and cognitive processes for reflective decision making.”

These researchers encourage the use of mid-range definitions to meet the needs of specific disciplines. Once the definition is decided, instructors can then choose from the many frameworks for teaching and evaluating the concept (Kataoka-Yahiro & Saylor, 1994; Kintgen-Andrews, 1991).

## **TEACHING CHALLENGES**

Each academic discipline teaches specific thinking skills. The basic sciences stress logic while applied sciences include other skills. The expert nurse's decision making often involves intuition and perceptions (smell, touch, etc.), quick life-saving decisions, and coordinating the thinker's entirety. Some theorists believe that creative thinking involves different skills from critical thinking, but nursing practice includes both types of thinking for clinical decision making. The usual critical-thinking framework relies on reductionism overlooking embodied knowledge, the roles of emotion, involvement, and communication.

Instructors usually teach a critical-thinking process then assess thinking outcomes. This approach does not consider a variety of variables that could influence the outcome product. Students may avoid parts of thinking frameworks while still coming up with "acceptable" outcomes. Since thinking is a process, teachers need to employ process evaluation rather than an outcome evaluation. The problem with process evaluation is that thinking is mostly an invisible process. The online environment might reduce this problem. Since discussions are visible online, insight into the critical-thinking process is also possible.

## **COLLABORATION**

Collaboration online is when "two or more subjects build synchronously and interactively a joint solution to some problem" (Knuth, 1973). The learning process consists of participants agreeing on task elements and assigning them to members who may work independently until each component is completed. Members assemble the task elements into a final product, which is often evaluated by the group

before submission. The process requires effective student thinking, discussion skills, and high levels of engagement (Fayyad, Piatetsky-Shapiro, & Smyth, 1996).

Researchers state that online collaboration and critical-thinking models are needed (Curtis & Lawson, 2001; Maher, Simoff, & Cicognani, 1997; Sudweeks & Simoff, 1999; Tiffin & Rajasingham, 1995). Nelson (1999) built a three-stage model for face-to-face academic groups that includes preparation, work, and conclusion phases. The preparation-phase tasks comprise getting ready, organizing, agreeing upon the problem, and establishing roles. The getting-ready tasks are the responsibility of the instructor and usually occur before the course and project begin. When getting ready, the instructor explains the collaborative process, allows group practice, overviews the class communication process, and describes the project. Agreeing upon the problem includes the brainstorming process and record keeping. Participants also negotiate roles needed for the group process. The work phase may take the longest time but has only three tasks: to plan, work, and finalize the project. The conclusion phase is often formally ignored in online groups. Conclusion entails reflection and assessment of the content and process.

As yet, no research about how this theory works online appears in the literature, although researchers have compared the processes in face-to-face and online settings. Cowles and Molinari (2001) found all elements of the theory were practiced in both environments. Differences occurred in each phase. Teachers spent more time structuring learning in the online environment. Students spent less time brainstorming online, and the conclusion phase was neglected by several groups.

The online environment is said to increase critical thinking, but few studies evaluate how this is done (Montclair State University, 1995). The nursing education problem-solving group moved online as soon as technology supported online dialogue. Sixty-two percent of all distance education faculty report using asynchronous communication tools according to the National Education Association (2000). However, conceptual models of how technology and teamwork may be productively integrated are sparse as are the number of online critical-thinking models

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