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Developing Critical Thinking Skills in Homeland Security and Emergency Management Courses

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Abstract

Since 9/11, colleges and universities throughout the nation have developed and implemented new courses and degree programs in homeland security and emergency management. A valued learning outcome of these programs, like most university studies in general, is to develop critical thinking skills in students. However, this can be a challenge because the nature of critical thinking and approaches to teaching and assessing it in higher education are debatable. This paper provides a brief overview of the literature on critical thinking, and looks at the importance of developing these skills in students of homeland security programs so that they are able to adapt successfully in a rapidly changing environment. Finally, this paper discusses two teaching strategies, guided class discussions and case studies, to develop critical thinking that have been used by the teacher in undergraduate and gradate level courses in homeland security.

KEYWORDS: critical thinking, problem-solving, instructional strategies, teaching, active learning, discussions, case studies

INTRODUCTION

Since the terrorist attacks of September 11, 2001, our sense of safety and security within our nation and communities has been fundamentally altered. Since 9/11, homeland security has been the prominent policy focus as the nation comes to terms with the uncertainty of how to deal with the new specter of terrorism in the United States. In this environment both students and practitioners in homeland security and emergency management must not only learn to prepare for an uncertain future, but also to deal with the systemic stress that homeland security places on American government and society. If public servants in homeland security are to deal effectively with these types of complex changes and challenges, as well as with increased demands for services and greater accountability, they must become skilled in higher-level thinking and reasoning abilities. Everyday homeland security and emergency management professionals sift through an abundance of information to assimilate and adapt knowledge for problem clarification and solutions. Thus, the use of critical thinking is vital in examining simple and complex situations in the day-to-day responsibilities of public servants, particularly those in the constantly changing fields of homeland security and emergency management. The failure to use such skills in a natural or man made disaster can lead to mass casualties, destruction of property, and loss of public trust as we witnessed after the 9/11 terrorist attacks in 2001 and Hurricane Katrina in August, 2005.

The 9/11 Commission Report (2004) provided a critical review of the events leading to the terrorist attacks and our inability to prevent this tragic event and adequately respond. The *9/11 Report* emphasized that we missed the opportunities to prevent these attacks because federal intelligence and law enforcement organizations failed to communicate with one another. The report stated "The biggest impediment to all-source analysis—to a greater likelihood of connecting the dots—is the human or systematic resistance to sharing information" (2004, 416). There was in effect large-scale blockage of "informational arteries" that adversely affected sharing and integrating vital information pertinent to the gathering terrorist attacks. These barriers reached from the FBI headquarters and its field offices to domestic and foreign intelligence agencies around the world. Throughout the summer of 2001, intelligence agencies were monitoring and assessing a growing threat in which an attack appeared imminent. Unfortunately, information was often stalled, stove piped, withheld, distorted or simply ignored. It is clear that federal officials were aware of a specific problem (imminent terrorist attack against the U.S.) yet failed to use critical thinking skills to identify and fix the broken or blocked communication arteries, or identify new ways of analyzing and disseminating information. As a result, no single individual or group within these agencies was

able to "connect all the dots"—and the summer of 2001 became a summer of missed opportunities.

Hurricane Katrina exposed the U.S. government's failure to learn the lessons of September 11, 2001, terrorist attacks, as leaders from President Bush down disregarded ample warnings of the threat to New Orleans and did not execute emergency plans or share information that would have saved lives. In the Congressional Report, *A Failure of Initiative,* the Select Committee identified significant institutional and individual failures at all levels of government and that Katrina "was primarily a failure of initiative" (2006, 1). The report said the single biggest federal failure was not anticipating the consequences of the storm even though disaster planners had rated the flooding of New Orleans as the nation's most feared scenario, testing it under a disaster preparedness program in 2004.

Despite having advance warning of the pending catastrophe, key government leaders such as Secretary of Homeland Security, Michael Chertoff, failed to respond effectively or at all before, during and after the disaster (Select Bipartisan Committee to Investigate Hurricane Katrina, 2006). As President Bush's principal disaster advisor, Chertoff poorly executed many decisions, including declaring Katrina an "incident of national significance" (INS)—the highest designation under the national emergency response plan and convening an interagency board of experienced strategic advisors three days after the event had met all of the criteria for designating an INS. Instead of making a clear and decisive choice to respond proactively at the beginning of the disaster, Chertoff's inaction and delay forced a reactive response that led to delays in getting supplies, equipment, and personnel where and when it was needed during the response to this disaster. In this situation, Chertoff demonstrated poor critical thinking skills by failing to properly evaluate, analyze and interpret information to address the problems posed by Hurricane Katrina. The 9/11 terrorist attacks and Hurricane Katrina not only demonstrated our nation's lack of preparedness and capacity to respond to large-scale natural or man-made disasters, but also, our leaders' inability to think critically. Thus, a critical outcome for undergraduate and graduate education programs in homeland security and emergency management must be the development if critical thinking skills in students.

Since 9/11, colleges and universities throughout the nation have developed and implemented new courses and degree programs in homeland security and emergency management. A valued learning outcome of these programs, like most university studies in general, is to develop critical thinking skills in students. However, this can be a challenge because the nature of critical thinking and approaches to teaching and assessing it in higher education are debatable. Course descriptions may refer to critical thinking as one of the learning outcomes of a degree without defining it, and course curricula do not necessarily provide classes on critical thinking for students. The often unstated assumptions seem to be that

students will develop as critical thinkers by osmosis, and that critical thinking will be assessed predominantly in written assignments. In general, critical thinking is a mental activity of evaluating arguments or propositions and making judgments that can guide the development of beliefs and taking action (Gilster, 1997). This paper will provide a brief overview of the literature on critical thinking, and look at the importance of developing these skills in students of homeland security and emergency management programs so that they are able to adapt successfully in a rapidly changing environment. This paper recognizes that critical thinking is important for all students and that the teaching strategies identified in this paper can easily be utilized in a variety of courses and across academic disciplines. This paper will discuss a number a teaching strategies to develop critical thinking that have been used in undergraduate and graduate level courses in homeland security.

LITERATURE REVIEW ON CRITICAL THINKING

Central to the interpretation of critical thinking is a realization that critical thinking is not a method to be learned, but rather a process, an orientation of the mind, and includes both the cognitive and affective domains of reasoning. The concept of cognitive and affective domains of reasoning refers to two elements of the taxonomy of learning domains designed by Dr. Benjamin Bloom to assist in the design and assessment of learning (Bloom, 1956). The cognitive domain involves knowledge and the development of intellectual skills. This includes the recall or recognition of specific facts, procedural patterns, and concepts that serve in the development of intellectual abilities and skills. There are six major categories starting from the simplest behavior to the most complex. These include: 1) knowledge or ability to recall data; 2) comprehension or understanding of problems; 3) application or use a concept in a new situation; 4) analysis; 5) synthesis or building a structure or pattern from diverse elements; and 6) evaluation or making judgments about the value of ideas and materials (Bloom, 1956).

The affective domain includes the manner in which we deal with things emotionally, such as feelings, values, appreciation, enthusiasms, motivations, and attitudes. The five major categories are listed from the simplest behavior to the most complex include the following: 1) receiving phenomena or awareness; 2) responding to phenomena or active participation on the part of learners; 3) valuing or the worth or value a person attaches to a particular object or phenomenon; 4) organization or organizing values into priorities; and 5) internalizing values or value system that controls a person's behavior (Bloom, 1973).

Bloom's taxonomy has been utilized by academics, educators, trainers and human resource professionals to design, develop, and evaluate educational

curriculum, college courses, and training materials. Thus, to design and evaluate college courses that develop critical thinking skills, professors must not only understand Bloom's taxonomy but also the concept of critical thinking.

As a concept, critical thinking has been expressed and defined in several ways. In the literature, there are a variety of definitions and ways of conceptualizing critical thinking. The following are some examples of attempts to define critical thinking:

- ...the ability to analyze facts, generate and organize ideas, defend opinions, make comparisons, draw inferences, evaluate arguments and solve problems (Chance, 1986, 6).

- ...a way of reasoning that demands adequate support for one's beliefs and an unwillingness to be persuaded unless support is forthcoming (Tama, 1989, 64).

- ...active, systematic process of understanding and evaluating arguments. An argument provides an assertion about the properties of some object or the relationship between two or more objects and evidence to support or refute the assertion. Critical thinkers acknowledge that there is no single correct way to understand and evaluate arguments and that all attempts are not necessarily successful (Mayer and Goodchild, 1990, 4).

The National Council for Excellence in Critical Thinking Instruction, which is made of hundreds of scholars of critical thinking, has one of the most comprehensive definitions of critical thinking. They define critical thinking as "the intellectually disciplined process of actively and skillfully conceptualizing, applying, analyzing, synthesizing, or evaluating information gathered from or generated by, observation, experience, reflection, reasoning or communication, as a guide to belief and action" (National Council for Excellence in Critical Thinking, 2008, 1). Scholars have not only identified a number of definitions for critical thinking but also a number of ways to describe this concept. Among the most influential scholars in the field of education has been John Dewey.

John Dewey, the American philosopher, psychologist and educator, is widely regarded as the 'father' of the modern critical thinking tradition. In his book, *How We Think,* he calls critical thinking reflective thought and defines it as, "active persistent, and careful consideration of a belief or supposed form of knowledge in light of the grounds which support it and the further conclusions for which is tends" (Dewey, 1910, 9). The most important aspect of Dewey's definition is in what he says about 'the grounds which support a belief' and 'the further conclusions to which it tends'. Here he is saying that what matters are the

reasons we have for believing something and the implications of our beliefs (Fisher, 2001). In addition, Dewey defines critical thinking as an 'active process' in contrast to a 'passive process', which is the kind of thinking in which you just receive ideas and information from someone else (Dewey, 1910). For Dewey critical thinking is essentially an active process in which you think things through yourself, raise questions yourself, find relevant information yourself, and solve problems yourself, rather than learning in a largely passive way from someone else. Thus to develop critical thinking skills, students must be active learners in the learning process and they must be required to identify and solve unstructured problems using multiple information sources.

Dewey roots critical thinking in the students' engagement with a problem. Dewey writes, "The most significant question which can be asked about any situation or experience proposed to induce learning is what quality of problem it involves" (1916, 188). Problems, for Dewey, evoke students' natural curiosity and stimulate both learning and critical thought. "Only be wrestling with the conditions of the problem at first hand, seeking and finding his own way out, does the student think" (Dewey, 1916, 188). Finally, Dewey argues that critical thinking involves the suspension of judgment and healthy skepticism (1916).

Other educational scholars such as Ennis (1962) suggest that students should be assisted in the engagement of thinking that is reflective, reasonable and directed on what to believe or do. Ennis views critical thinking as 'the correct assessing of statements,' and notes that an individual who is able to think critically, according to this definition, has the skills to evaluate statements (Ennis, 1962, 82). Thus for Ennis and Dewey critical thinking is viewed as a cognitive skill that could be developed in students by teachers using a number of instructional strategies.

Watson and Glaser view critical thinking, however, as being more than a specific set of cognitive skills. They argue that critical thinking is a composite of skills, knowledge and attitudes (Watson and Glaser, 1980). Watson and Glaser (1980) further explain that critical thinking comprises an understanding of the nature of making inferences and generalizations, and the skills of being able to carefully consider the logic and accuracy of evidence. These authors also express the idea that having the ability to think critically is a key element to being fully functional in our modern and complex society. For them, critical thinking is a fundamental requirement of being able to actively participate in one's social and political circles. Facione and Sanchez (1994) show how attitude plays a significant role in critical thinking. They argue attitude is important because it influences the person's ability to question life's complexities or underlying assumptions in a situation or circumstance (Facione and Sanchez, 1994).

McPeck believes that critical thinking involves both a propensity and skill, and that 'one must develop the disposition to use those skills' (McPeck, 1981, 3).

Hence, teaching someone to be a critical thinker entails both the cognitive and the affective domains of reasoning. McPeck's work revolves around two components of critical thinking, the context of discovery and the context of justification. The first phase of critical thinking is called the context of discovery. In this phase we are faced with a problem, a puzzle, a doubt, a critical thinking "issue," in which we must formulate some ideas, no matter if we later reject them or not (McPeck, 1981). To generate these ideas we must have data, material, ideas on which we might think critically. In the discovery stage, we get ideas from many sources including from tradition, authorities, feelings, intuitions, culture, habit, personal and professional experiences, and the media to name a few. Once we have formulated a position, claim, belief, or hypothesis, then we must use critical thinking skills to rationally justify our position; this is called the context of justification (McPeck, 1981).

In keeping with McPeck's second aspect of his argument, Kurfiss (1988) establishes the idea that critical thinking is associated with the justification of beliefs. Kurfiss (1988) points out that argumentation is the process by which this justification is presented. Bell (1991) suggests that one way to develop this skill is involvement in debates, because the steps in a debate process comprise all of the argumentation skills essential to critical thinking, such as analyzing a problem, finding evidence, constructing a case, organizing information in order to deliver a speech, planning refutation, rebuttal and debating. Other education scholars state that critical thinking is more than a set of skills, and that argumentation is a focal point in critical thinking (Bell, 1991; Facione, 1990; Brookfield, 1987).

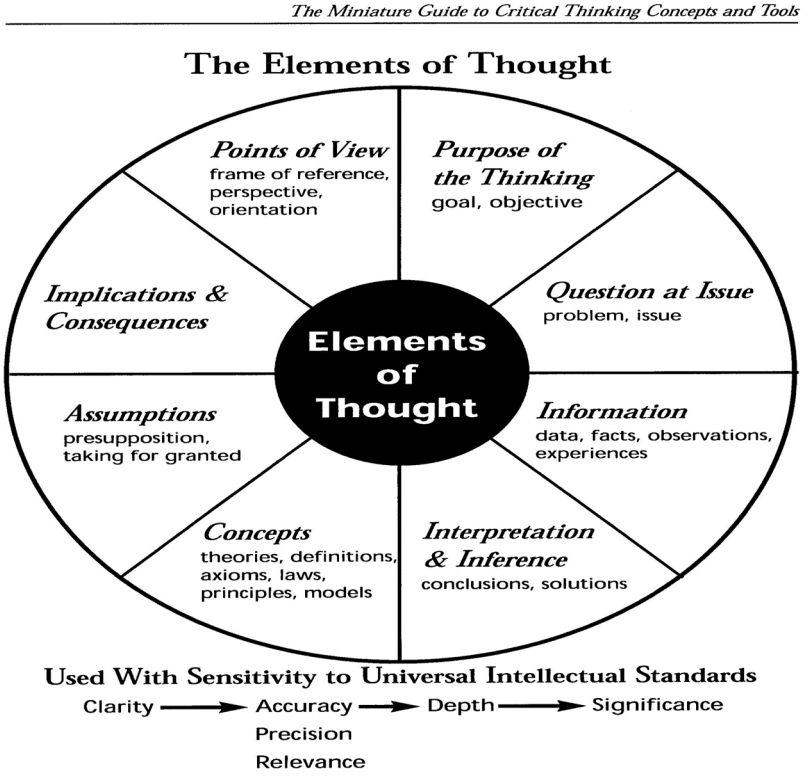
Brookfield (1987) proposes that critical thinking entails more than cognitive skills, such as logical reasoning or scrutinizing arguments. Brookfield agrees that emotions are paramount to the critical-thinking process, because as one attempts to think critically and assists others to do so, they cannot help but become conscious of the importance of their emotions to this activity. Brookfield identifies specific character traits in critical thinkers. Brookfield (1987) argues that critical thinkers are typically individuals that engage in productive and positive activity, in that they are actively involved with life, and perceive themselves as creative in aspects of their personal, professional and political lives. Further, he suggests that critical thinkers view their thinking as a process, rather than as an outcome. In this instance, Brookfield (1987) explains that a critical thinker is continually questioning assumptions of right and wrong. This is because critical thinking is not static; it does not bring a person to a position of finality or conclusion.

Regardless of the definition or conceptualization of critical thinking we subscribe to, the greatest challenge for educators is identifying an agreed upon method to evaluate critical thinking skills of students. How do we measure and assess critical thinking in our college students? Dick (1991) argues that there is

no approach available that can delimitate critical thinking from other higher order thinking skills such as creative thinking, problem solving and decision-making. Dick (1991) reviewed the educational literature on critical thinking over a 40-year period and created a taxonomy highlighting the characteristics of critical thinking. According to this taxonomy, critical thinking consists of identifying and analyzing arguments, of considering external influences on arguing, of scientific analytic reasoning, and of logical reasoning.

A taxonomy was also developed by Richard Paul and Linda Elder of the Foundation for Critical Thinking. Paul and Elder (2005) separate "all thinking" into eight distinguishable, related and necessary steps that they call the elements of thought. Paul and Elder (2005) argue that critical thinking involves the ability to raise vital questions and problems; to gather and assess relevant information; to use abstract ideas to interpret information effectively; to come to well-reasoned conclusions and solutions, testing them against relevant criteria or standards; and to think open-mindedly within alternative systems of thought, recognizing and assessing their assumptions, implications, and practical consequences. This is shown in Chart 1 from *The Miniature Guide to Critical Thinking Concepts and Tools* written by Paul and Elder (2005).

CHART 1: Elements of Thought



Paul and Elder (2005) further argue that successful thinkers move more or less sequentially through a standard process of identifying problems, making reasonable assumptions about the nature of the problems, discerning criteria according to which information about the problems can be deemed relevant and well understood, making inferences from the pertinent data and organizing these inferences into concepts that will help in coming up with a workable solution.

Paul and Elder (2005) use these Elements of Thought to create a checklist for students to utilize to guide them in their analytic thinking that is shown in Table 1. The benefit of this model and checklist to instructors and students is that they teach individuals how to analyze a broad range of materials from news articles, to chapters in textbooks, to government reports, to novels and poems.

TABLE 1: Elements of Thought Student Checklist

Students should regularly use the following checklist for reasoning to improve their thinking in any discipline or subject area:

1. All reasoning has a **purpose**.
   a. State your purpose clearly.
   b. Distinguish your purpose from related purposes.
   c. Check periodically to be sure you are still on target.
   d. Choose significant and realistic purposes.

2. All reasoning is an attempt **to settle some question, figure something out, or solve some problem.**
   a. State the question at issue clearly and precisely.
   b. Express the question in several ways to clarify its meaning and scope.
   c. Break the question into sub-questions.
   d. Distinguish questions that have definitive answers from those that are a matter of opinion and from those that require consideration of multiple viewpoints.

3. All reasoning is based **on data, information, and evidence.**
   a. Restrict your claims to those supported by the data you have.
   b. Search for information that opposes your position, and information that supports it.
   c. Make sure that all information used is clear, accurate, and relevant to the question at issue.
   d. Make sure you have gathered sufficient information.

TABLE 1: Elements of Thought Student Checklist

4. All reasoning contains **inferences or interpretations** by which we draw conclusions and give meaning to data.
   a. Infer only what the evidence implies.
   b. Check inferences for their consistency with each other.
   c. Identify assumptions that lead you to your inferences.

5. All reasoning is expressed through, and shaped by, **concepts and ideas.**
   a. Identify key concepts and explain them clearly.
   b. Consider alternative concepts or alternative definitions of concepts.
   c. Make sure you are using concepts with care and precision.

6. All reasoning is based on **assumptions** (beliefs you take for granted).
   a. Clearly identify your assumptions and determine whether they are justifiable.
   b. Consider how your assumptions are shaping your point of view.

7. All reasoning is done from some **point of view.**
   a. Identify your point of view.
   b. Seek other points of view and identify their strengths and weaknesses.
   c. Strive to be fair-minded in evaluating all points of view.

8. All reasoning leads somewhere or has **implications and consequences.**
   a. Trace the implications and consequences that follow from your reasoning.
   b. Search for negative as well as positive implications.

The model, The Elements of Thought, created by Paul and Elder (2005) corresponds, in part, to the components of critical thinking identified by education scholar, Stephen Brookfield (1987). Brookfield identified four components of critical thinking: assumptions, context, alternatives, and reflective skepticism. First, Brookfield states (1987) identifying and challenging assumptions are considered a major tenet of critical thinking. Critical thinkers are always mindful of how assimilated assumptions shape their perceptions, understandings and interpretations of themselves and the world around them. Brookfield describes assumptions as the "seemingly self evident rules about reality that we use to help us seek explanations, make judgments, or decide on various actions" (1987, 44). Assumptions are acquired in childhood and influence how we understand cause and effect relationships (for example seeing terrorism as a result of oppression as

opposed to poverty), how we understand human nature, how we determine what is appropriate conduct, and how we see the political world.

Second, Brookfield (1987) argues that promoting the importance of context is crucial to critical thinking. Critical thinkers are aware of how hidden and uncritically assimilated assumptions are important to shaping our habitual perceptions, understandings and interpretations. The third component identified by Brookfield relates to critical thinkers having the capacity to imagine and explore alternatives, that is, they are lateral in thought processes. Critical thinkers, states Brookfield, "are continually exploring new ways of thinking about aspects of their lives" (1987, 8).

The fourth component of Brookfield's model refers to reflective skepticism. Here Brookfield is referring to individuals who recognize alternatives to supposedly fixed belief systems, habitual behaviors and entrenched social structures. Thus, individuals who are critical thinkers become skeptical of claims to universal truths or to ultimate explanations and do not take things for granted or as real. Therefore, learning to think critically involves expanding a person's thought processes. By having a clearer understanding of how critical thinking is defined and conceptualized, college faculty may be better prepared to teach critical thinking skills using a variety of instructions methods and strategies**.**

CRITICAL THINKING IN HIGHER EDUCATION

Though critical thinking is difficult to define and to measure, it is a highly valued outcome of higher education. Barnett laments, "Critical thinking is a defining concept of the Western university. Almost everyone is in favor of critical thinking, but we have no proper count of it" (1997, 2). When critical thinking is defined for application to university contexts, the same key terms for critical thinking abilities or skills are found again and again, and include: questioning, evaluation, analysis, reflection, inference and judgment. Despite the range of views on the nature of critical thinking, there is widespread agreement in the literature that critical thinking in a university environment involves students' abilities to identify issues and assumptions, recognize important relationships, make correct inferences, evaluate evidence or authority, and deduce conclusions (Tsui, 2002).

At most universities, it is assumed that professors are teaching critical thinking to students but how this is being achieved is highly debatable because the way in which critical thinking is fostered in university study may depend on academics' attitudes towards the curriculum. Browne and Freeman contend that "deference to critical thinking as an educational objective is certainly more common than the actual encouragement of critical thinking in university classrooms" (2000, 301). Faculty, for the most part, support critical thinking development as a part of their teaching charge, but they are rarely taught how to

define critical thinking, much less how to effectively facilitate its development (Bailin, Case, Coombs, and Daniels, 1999). Some may see a limited role for critical thinking in the subjects they teach. When academics are concerned about their students' critical thinking, their conceptions of the nature of critical thinking may affect how they promote its development in their students. This involves the old debate over whether critical thinking is a set of generic skills that transfer across disciplines, or is embedded in academic disciplines. The generic view taken by Norris and Ennis (1990) and Norris (1992) is that critical thinking involves skills that can be taught independently of disciplinary content. Proponents of a generic view may thus prefer to leave the teaching of critical thinking to a critical thinking expert.

Those scholars who see critical thinking as embedded in context are represented by McPeck who argues that "disciplinary knowledge already contains the major portion of what most people understand by "critical thinking" (1990, 34). McPeck (1990) writes that if the disciplines are properly taught, the students will practice the kind of intelligent thought that is normally seen as critical. Proponents of this view may be more likely to teach critical thinking to their students but research has shown more often that this is not the case.

A great deal of educational research shows that many academic disciplines are not systematically developing critical thinking skills in students (Patry, 1996). It seems that many times students are left to absorb critical thinking skills by osmosis if their lecturers rely on setting assignments that require critique and then assume that students are learning how to be critical thinkers by doing the assignments. Patry (1996) explains this 'abdication' from overt teaching of critical thinking by the fact that many academics feel that they do not have the time or the strategies to teach critical thinking. There are a number of reasons why critical thinking is not supported and systematically taught in daily instruction. The main reasons for this shortcoming are that teachers are not educated in critical thinking; there are few textbooks available on critical thinking; and teachers have no time and other instructional resources to integrate critical thinking into their daily instruction (Astleitner, 1998). As we develop courses and programs in homeland security, it is critical that we use educational strategies that develop critical thinking skills in our students.

EDUCATIONAL STRATEGIES TO DEVELOP CRITICAL THINKING

Educational scholars have long advocated the integration of instructional strategies to foster critical thinking. Paul (1990) states that it is important for educators to abandon methods that make students passive recipients of information and adopt those that transform them into active participants in their own intellectual growth. Oermann writes that "critical thinking is not developed

through one lecture, instead skill in thinking develops over time through various experiences" (1997, 22). Thus, teachers should make critical thinking a regular classroom experience.

To accomplish this there are a number of strategies or instructional methods that can be utilized and are effective in promoting, attaining, and advancing the acquisition of critical thinking. Kurfiss (1988) offers a range of strategies to encourage the critical thinking process such as: 1) formal/informal writing assignments or brief case studies; 2) questions that involve reasoning skills and the ability to organize and articulate knowledge; and 3) dialoging on complex problems. Over the past four years, I have integrated these strategies in the graduate and undergraduate level Terrorism and Homeland Security Courses I have designed and implemented. Among the most effective strategies I have used are class discussions, case studies and short writing assignments.

Use of Questioning and Class Discussions

In my Web based and classroom based courses in homeland security and public administration, I have found that to facilitate critical thinking it is important to create good questions for discussions, to facilitate dialogue on complex issues, and to provide feedback and direction to students. By using well-guided discussion formats, students are not only directed in their search to find answers but also in producing new questions for consideration and analysis. Paul and Elder (2000) argue that by creating an environment where questions produce other questions, instead of dead-end answers, students and instructors are actively involved in the critical thinking process. When we focus our students on finding the answers, we stop them from thinking. However, if we can teach them to ask questions and give permission for their questioning, we set the stage for critical thinking to occur.

The big challenge for instructors is letting go of the need to know all the answers; only in this process will our students embrace the questioning. Paul and Elder (2000) conclude by reminding us that a lack of questions results in a lack of understanding, and shallow questions produce shallow understanding. In fact, Stansberry, Haulmark, and Sheeran (2003) found that instructors were poorly prepared to write questions that would elicit higher order thinking responses from their students. Therefore, if we want our students engaged in the critical thinking process we must motivate them with well-written questions that guide them into asking more questions. Higher-level thinking questions should start or end with words or phrases such as, "explain," "compare," "why," "which is a solution to the problem," "what is the best and why," and do you agree or disagree with this statement?" For example, a student could be asked to compare and contrast the FEMA organizational structure before and after 9/11. Examples of words that can

be used to begin questions to challenge students at the different levels of Bloom's taxonomy are given in Table 2. This taxonomy is a hierarchy of thinking skills that ranges from simple skills, such as knowledge, to complex thinking, such as evaluation. Depending on the initial words used in the question, students can be challenged at different levels of cognition.

Table 2: Examples of Questions using Bloom's Taxonomy

Category	Key Concepts	Examples
Knowledge	Memorization, description	What, when, who, describe, identify, show
Comprehension	Explanation, Comparison	Conclude, demonstrate, explain, give an example of
Application	Solution, Application	Build, solves, how would you
Analysis	Deduction, Induction	What assumptions, support your, what reasons
Synthesis	Productive Thinking	Propose a plan, formulate a solution
Evaluation	Judgment, Selection	Evaluate, decide, defend

For each topic that I teach in my homeland security courses, I design discussion questions to meet my learning objectives for the unit using Bloom's Taxonomy. These questions have then been used on exams, for short paper assignments and for class discussions. For example in a unit on terrorism the following questions were developed from each of the categories:

Category	Sample Questions
Knowledge	1. What are the common characteristics in most legal and academic definitions of terrorism?
Comprehension	2. Explain the differences between the behavior of terrorists and guerrilla fighters?
Application	3. Create a typology to use to analyze terrorist events
Analysis	4. What assumptions are being made with the phrase, "One man's terrorist is another man's freedom fighter."
Synthesis	5. Currently we have a "war on terrorism." Are there other possible conceptual lenses or ways in which we can study and understand terrorism?
Evaluation	6. Evaluate the contents of a jihadist website to determine how it is being used as a force multiplier.

The creation of good questions is particularly important with discussion formats in web-based courses. Muilenburg and Berge argue "when facilitating online discussion, asking the right questions is almost always more important than giving the right answers" (2000, 2). The challenge for teachers is to create probing questions that will engage and direct students in class discussions.

Classroom discussions and debates can promote critical thinking. Bernstein (1985) developed a negotiation model in which students are confronted with credible but antagonistic arguments. Students were challenged to deal with the tension between two arguments. This tension is believed to be one component driving critical thought. There are many controversial issues in homeland security that can be presented to students and discussed including the use of torture on suspected terrorists, and the use of data mining and other surveillance techniques to prevent terrorism. Another strategy I have used in my courses to promote students to seek both sides of an issue is pro and con grids. Students in my homeland security courses create grids with the pros and cons or advantages and disadvantages of an issue or policy. For example, students have been assigned to develop pro and con grids for the Real ID Act, Patriot Act II, and other controversial legislation in homeland security.

An effective tool that I have used in formulating class discussion questions and in responding to student questions is the typology of probing questions created by Brad Stepien (2008). In discussing problem-based learning, Stepien (2008) adapted some of Richard Paul's (1990) critical thinking approaches to develop a set of five question types: clarification, assumptions, reasons and evidence, viewpoints or perspectives, and implications and consequences. He also provides specific questions for each of the categories. Table 3 provides a selection of questions from each of the Stepien's five categories.

I have found that this approach provides infinite opportunities for critical thinking and extends learning beyond content mastery. By carefully defining the desired outcomes for both online and classroom discussions, instructors set the stage for effective discussions that utilize good questioning to build critical thinking skills. I have found courses organized around intriguing open-ended questions arouse curiosity about the subject, engage the learner, and promotes further questioning and thinking about a subject.

TABLE 3: Typology of Probing Questions

Questions that probe for:	Example Questions
Clarification	Let me see if I understand you; do you mean __ or _? What do you think Mike means by his remark, Dee? How does this relate to our problem/discussion/issue? Jane, can you summarize in your own words what Richard said? Richard, is this what you meant? Would this be an example? Would you say more about that? How does __ relate to __?
Assumptions	What are you assuming? What is Jenny assuming? What could we assume instead? You seem to be assuming __. Do I understand you correctly? All of your reasoning depends on the idea that __. Could you have based your reasoning on __ instead of __? Is that always the case? Why do you think the assumption holds here? Why would someone make that assumption?
Reasons and evidence	What would be an example? Do you have any evidence for that? What other information do you need? What led you to that belief? How does that apply to this case? What would change your mind? Is there a reason to doubt that evidence? Who is in a position to know that is true? What would you say to someone who said that __? What other evidence can support that view?
Viewpoints or perspectives	When you say __, are you implying __? But, if that happened, what else would happen as a result? Why? What effect would that have? Would that necessarily happen or only possibly/probably happen? What is an alternative? If __ and __ are the case, then what might also be true?
Implications and consequences	How can we find out? Can we break this question down at all? Is this question clear? Do we understand it? To answer this question, what other questions must we answer first? Why is this issue important? Is this the most important question, or is there an underlying question that is really the issue?

Using Case Studies to Develop Critical Thinking

The use of the case method to teach has been used effectively in face to face and on line classes for a number of years. The case method is an active learning strategy that engages students, fosters higher order thinking, and facilitates problem-solving skills (Levine, 1994; Herreid, 1994; Brooke, 2005; McKeachie, 1999). According to McKeachie the case method, like other problem based learning strategies, "are intended to develop student ability to solve problems using knowledge, concepts, and skills relevant to a course. Cases provide contextualized learning, as contrasted with learning disassociated form meaningful context" (1999, 177). These problems are used to engage students' curiosity and initiate learning the subject matter. The teaching strategy identified as case method or the use of case studies can be described as a description of an administrative decision or problem; it is normally written from the point of view of the decision maker involved. McKeachie states, "Cases are often actual descriptions of problem situations in the field in which the case is being used; sometimes, they are syntheses constructed to represent a particular principle or type of problem" (1999, 177). Herreid (1994) describes the case method as an inductive process by which students learn through their joint, cooperative effort as opposed to the professor conveying views to students. This is in direct opposition to what Friere (1971) termed, the banking method of education. With the banking method of education, students are repositories for the instructor's information. The students then spit back the facts that the instructor has provided – there is no critical thinking involved in this practice. With the case method, students and the professor engage in a dialogue which fosters critical thinking skills. The case method is designed to enhance student understanding of core concepts of the course as well as to encourage critical thinking.

In using cases, students become active; it is learning by doing. Cases provide students with the opportunity to exercise decision making, whether individually or in a team format. Washull (2005) argues that for the disciplined student, cases help increase motivation. Further, it provides them with real life examples that allow them to link theoretical reading to real world problems. Some students have difficulty connecting the theory to real life, practical examples. The case approach ameliorates this problem. Brooke (2005) argues with the case method the students engage in the intellectual, and emotional, exercise of facing complex problems and making critical decisions within the constraints imposed by reality (such as limited time and information).

With case studies, the students strive to resolve questions that have no single right answer. In their effort to find solutions and reach decisions through discussion, students sort out factual data, apply analytical tools, articulate issues, reflect on their relevant experience, and draw conclusions they can carry forward

to new situations (Lange, 1986; Erskine, 1981; Boehrer and Linsky, 1990). In the process, they acquire substantive knowledge, develop analytic and collaborative skills, and gain in self-confidence and attention to detail. In addition to analysis, other learning outcomes include application of theory, synthesizing material, and making evaluations (Lang, 1986; Erskine, 1981). By providing opportunities for application, analysis, synthesis, and evaluation, the case method goes beyond the recall and recognition tasks that are associating with the banking method of education (Gross, 1999). In traditional teaching the professor transmits information and data normally through lectures while the students passively listen and take notes. With case teaching, the role of the professor is to guide and facilitate students in learning and understanding the material within the case (Golich, 2000).

Through the use of the case method and thought questions, the instructor can promote active engagement in the traditional and virtual classroom. Since many cases focus on real life problems and dilemmas, the students will be able to transfer this information to other settings, such as their work environment. Many of my students already have careers so the practical applications of the case method approach are immediately applicable. In addition, the case method strategy promotes social change in that students reflectively and critically examine their own thoughts in relation to the course material and other students' responses. Most importantly, case studies are learning centered and allow the students to take responsibility for their own learning, while instructors serve as facilitators.

In the classroom version of my homeland security courses, I often introduce short cases to enhance my lectures and promote critical thinking. Though cases studies are often well received by students, they can be difficult to design and use in some classroom environments. First, in using the case method, instructors must find or write cases that will fit the learning objectives of their course. Public administration professors can obtain cases from a number of sources including the John F. Kennedy School of Government at Harvard University, the Harvard Business School, Pew Case Program at Georgetown University, the Case Method Instruction Outreach Project at Vanderbilt University, and many other universities, professional associations, and think tanks. Since preparing case studies is time consuming, professors may want to begin by reviewing cases developed by others.

When I began teaching courses in homeland security four years ago there were few case studies that had been written in this policy domain, thus I initially developed my own short cases. These cases often ran 3-5 pages and were brief accounts of a specific problem that students were asked to analyze. Cases were often developed from newspapers, magazine articles, journal reports, or new legislation that would support the learning goals of the course as well as appeal to

the students. Boehrer and Lisky (1990) state that a good case study tells a story, raises thought provoking issues, has elements of conflict, lacks an obvious clear cut answer, encourages students to think and take a position, demands a decision, and promotes empathy with the central characters.

In a unit that I teach about government bureaucracies and how the Department of Homeland Security is organized, I use a case study on Hurricane Katrina to highlight some of the limitations to this type of organizational structure in responding to crisis. I handout the case in class and instruct students to read it. I introduce the case by briefly summarizing the situation and identify the problem. I present facts but do not analyze the case. I then use questions to move students through the five typical stages of case analysis (Golick, 2000):

- What is the situation? (What happened during Hurricane Katrina?)
- What are the possibilities for action? (Who are the actors and what are their interests? What immediate action should have been taken?)
- What are the consequences of each? (What led to the failures here?)
- What action, then, should be taken?
- What general principles and concepts seem to follow from this analysis?

As students present their views, I ask for clarification and reactions from other students, and keep a list on a white board of all the issues being raised by the case for more in-depth discussion later. In facilitating this type of learning the professor must concentrate on individual comments, group thinking and their teaching plan (Golick, 2000). In reviewing cases, professors will want to pose questions and guide the discussion towards points of major importance, but avoid lecturing or telling students the "right" answer. By using probing questions, and challenging and rephrasing student responses, students are able to analyze the case for themselves (Boehrer and Linsky, 1990). At the conclusion of the discussion, I summarize the key points and help students discuss how the content from the day's session relates to the rest of the course. I have found that using the case method has not only stimulated analysis and learning but also promoted higher order and critical thinking skills.

Writing Assignments

In-class and out-of-class assignments can serve as powerful vehicles to allow students to expand their thinking processes. Emig (1983) believed that involving students in writing serves their learning uniquely because writing, as process and product, possesses a cluster of attributes that correspond uniquely to certain powerful learning strategies. Thus, another major teaching strategy that I use to promote critical thinking in my courses is short writing assignments that link key theories and concepts of a unit to real world events. Frequent, short writing

assignments help students clarify concepts, prepare for discussions, and practice critical thinking skills such as interpreting data (Griffith, 1982; Newell, 1984). Writing short essays in response to analytical questions fosters more learning and thinking than does note taking or responding to study questions (Newell, 1984).

In my courses, I have the students complete practical exercises in which they read a news story about the topic we are covering for the week and answer specific questions. In other exercises, students may be asked to go to specific websites and analyze the contents and answer discussion questions. These exercises often lead to lively discussions in which a variety of perspectives are offered. Finally, I have integrated various critical thinking exercises identified by Fopma-Loy and Ulrich (1999) into my classes to promote higher order thought. These exercises, listed in Table 4, are completed as short writing assignments as a means of incorporating the affective domain of learning into the classroom. Many of these exercises incorporate a personal reaction from the student and allow the student to link that learning to his or her feelings. Linking this personal reactions and feelings to cognitive information is important to show the relevance of the material being presented.

TABLE 4: Exercises to Promote Critical Thinking

1. Summarize 5 major points made in this chapter or article. Identify an individual you believe would disagree with these points. Write the reactions and counterarguments of this individual to the major points you identified.
2. Discuss the essence of this chapter or article using a metaphor.
3. Explain this chapter or reading to your neighbor, who has a high school education and has not been in the work force for 15 years. How would you explanation differ if you were explaining the reading to your public administration professor? Why, and what assumptions did you make when you were developing each explanation.
4. How might the information you gained from this reading affect you personally and professionally?

CONCLUSION

It is clear in our post 9/11 world that critical thinking is an important skill for students to develop in undergraduate and graduate homeland security and emergency management courses in higher education. As professors we cannot assume that critical thinking will automatically be taught to students as they attend a range of disciplinary specific courses. Faculty in all disciplines should teach students the highest standards of critical thinking activities within a subject

matter. As new academic programs are developed in homeland security and emergency management, every effort must be made by faculty to design these courses to nurture critical thinking. Professors must move beyond the temptation to design and implement the traditional banking method of education where students are merely seen as repositories for the instructor's information and no active learning or critical thinking occurs. Kurfiss found in her examination of successful disciplinary courses devoted to teaching both subject matter and critical thinking, that the professor establishes an agenda that includes learning to think about subject matter" (1988, 88).

A good critical learning course presents students with problems, questions, and issues that make a course assignment centered rather than text or lecture centered. Problems can be presented as discussions for small group problem solving, as think-on-your feet questions for large group discussions using the Socratic method, as formal or informal writing assignments, or as case studies. The point of these teaching strategies is to promote active exploration of ideas through talking and writing. Critical thinking is developed in students as they move through the process of identifying problems, gathering facts and data about the problem, making reasonable assumptions about the nature of the problems, discerning criteria to analyze the problems, and identifying possible solutions to complex problems and their consequences. In this paper, I have shared some of the instructional strategies that I have found effective in developing critical thinking skills in students in undergraduate and graduate level homeland security courses. It is my hope that those teaching within the discipline of homeland security and emergency management will continue to share their teaching experiences and identify "best practices" in developing critical thinking skills in our students.

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