Developing Critical Thinking in College Programs

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Abstract

The general public sometimes regards accounting as a rule-bound, algorithmic profession—as simple bookkeeping—when in fact it has been and is increasingly focused on creative thought. Accounting "rules" are fundamentally invitations to the accountant to practice critical thinking. The accounting profession faces increased demands from students, parents and employers to prepare students better; programs must "do more" with ever-diminishing resources. In response to these demands, many programs now go beyond teaching traditional accounting knowledge to focus on writing, critical thinking and other important skills to help develop more graduates that are successful. After discussing the general background of critical thinking skills, we discuss how college programs have and can more effectively implement this important skill. We thus summarize proven methods to develop critical thinking skills and show how faculty members can use these ideas in an accounting context.

Keywords: thinking, critical, accounting, skills, teaching, writing

Introduction

The general public sometimes regards accounting as a rule-bound, algorithmic profession—as simple bookkeeping—when in fact it has been and is increasingly focused on creative thought. For example, accounting seems to be moving from a *rules-based* profession that focuses on ascertaining if the client or company followed pre-ordained rules (regardless of the underlying economic circumstances) to a *principles-based* profession, e.g., assuming responsibility that the set transactions follows overall guidance. For example, under a rules based system, an entity should not capitalize a lease that covers 74.49% of the asset's expected life, but under a principles-based system the entity should focus on whether the proposed lease contains the lack of a "transfer" of risk associated with capital lease transactions. Since accounting "rules" are fundamentally invitations to the accountant to practice critical thinking, as new technologies and global realities work their way through the accounting profession, the demand for change in preparing accountants increases. Clients now expect professional accountants to "add value" to what these accountants observe, read and write; i.e., to evaluate complex systems and information, and detect, predict, advise and recommend appropriate courses of action. Critical thinking is generally the name of the process that provides this added value and communicates the results effectively to others.

The accounting profession has demanded improved critical thinking skills in the past. For example, Hardy, Deppe and Smith (1992) reported that Brigham Young University (BYU) received an Accounting Education Change Commission grant for its proposal for curriculum evaluation and modification, placing increased emphasis on critical thinking (as well as communications, group work and people skills). More recently, Springer and Borthick (2007) found that accounting education would be well-served by having students improve their higher-order critical thinking skills, including their cognitive conflict task skills which entice learners to make more elaborations and inferences to resolve conflicting aspects and to strengthen their abilities to comprehend and respond to business dilemmas.

CPA firms, management accountants and other employers of accounting graduates want improved competency in critical thinking and other related skills. For example, the National Association of State Boards of Accountancy (NASBA) wants to revamp the entire accounting curriculum required to sit for the Uniform CPA exam, and the Institute of Management Accountants (among other accounting organizations) responded to this suggestion by suggesting that the accounting profession study accounting curricula more deeply. Thus, today's graduating students and practitioners must respond to the progressive diversity and complexity of accounting practice and develop life-long learning skills that focus on their ability to think critically; i.e., to understand, apply and adapt concepts and principles in a variety of contexts and circumstances. Colleges should understand this process and ground their students in it to help prepare their students to meet today's professional challenges. After defining critical thinking, we will discuss various ways to bring it into the accounting curriculum.

Background

Critical thinking has many definitions. The American Heritage Dictionary (2008) characterizes *critical* not as negative or neutral, but as "careful and exact evaluation and judgment." Critical thinking points to a positive ability in those who possess it. Focusing on problem definition and problem solving, responding rationally to questions that cannot be answered definitively and for which all relevant information may be unavailable. It explores situations to derive optimal, justifiable hypotheses or conclusions. This thinking rests on a basic wariness; a willingness to take nothing for granted and to approach each experience as if it were unique—it demonstrates the qualities that we associate with a good accountant, especially a good auditor. While keeping a constant purpose—to understand—it usually leads to evaluation and, thus, to judgment.

This critical thinking approach differs greatly from other methods of thinking. Ideas are always present in our minds; hence, we always think in one way or another. Daydreaming is one kind of thinking (usually an unfocused kind), as is remembering (focused but uncreative—simple information retrieval). But critical thinking is purposeful, goal-oriented and creative—as an active process rooted in a series of qualities that add up to a wariness attitude that takes nothing for granted.

Just as good writing entails intensive rewriting, critical thinking entails rethinking, or transcending the obvious and easy way. It requires a willingness to say, "I don't know." It requires openness to alternative ways of seeing and doing—alternatives based on an understanding of how things work and a caring for ideas of others even when they don't agree with yours. It requires thoughtfulness, including genuine (not merely idle) curiosity; desire to find out what other people have done and thought, and insistence on getting the best evidence before drawing conclusions (Boostrom, 1992).

The general purpose of critical thinking is to understand. But its goal goes beyond the purpose: it almost invariably leads to evaluation and therefore to judgment. In the end, we all should judge the value of that which we have reflected on. Critical thinking is a process of understanding how thinking and learning work, using higher order skills to comprehend issues, and analyzing, synthesizing, and assessing those ideas logically. It focuses on an attitude and the activity of using higher-order reasoning skills, such as analysis of a problem, or breaking ideas into their component parts to consider each of them separately, synthesis or the connection among different components or ideas in order to derive relationships that tie the parts of an answer together, critical assessment of the conclusions reached, requiring an examination of the conclusions for soundness of reasoning and logic.

King and Kitchener (1994) Wolcott and Lynch (1997), Wood and Lynch (1998) and other researchers in accounting education define critical thinking more narrowly as "reflective judgment." King and Kitchener (1994) note that reflective judgment focuses on the underlying assumptions or processes involved in addressing unstructured problems. Wolcott and Lynch (1997) have developed writing assignments and a measurement rubric to help develop and assess the skills students use in the reflective judgment process, such as specific prompts to provide information on students' abilities to recognize their own potential biases, potential multiple perspectives and viable options. King and Kitchener (1994) have developed a seven-stage reflective judgment

model, which Springer and Borthick (2004) tested on their students—finding that reflective judgment in a business simulation environment can significantly improve students' critical thinking skills.

The American Institute of Certified Public Accountants (AICPA) has attempted to translate the concepts in thinking, such as the preceding, into an accounting-targeted set of principles; however, educators have not responded well to the AICPA's recommendations. Kimmel's (1995) study finds that accounting educators replying inadequately to the profession's demand for improved students' critical thinking skills. For example, the Accounting Education Change Commission (AECC) (1990) called for general education criteria that develop students' capacities for inquiry, abstract logical thinking, and critical analysis. The AECC (1992) specifically asked that the first accounting principles course ask students to analyze and solve unstructured problems; the AECC funded a grant for Community Colleges to strengthen their students' critical thinking skills (Williams 2002).

Baril, et al. (1998), Kern (2000), Wolcott et al. (2002), Warren (2005) and others stress that the accounting profession has developed no universally agreed-upon definition of "critical thinking" or how to improve such skills. Nonetheless, a review of the literature finds that the term critical thinking generally associates with such terms as "higher-order" thinking and cognitive skills and reflective judgment.

Moreover, the AICPA (1999) named critical thinking as one of its "Broad Business Perspective Competencies," encompassing "the ability to link data, knowledge, and insight together from various disciplines" and including the following elements:

- Articulates the principles of the strategic-planning process;
- Identifies strengths, weaknesses, opportunities, and threats associated with a specific scenario, case, or business activity;
- Identifies and gathers data from a wide variety of sources to provide insightful interpretations for decision making;
- Transfers knowledge from one situation to another; and
- Analyzes and prepares strategic information (e.g., market share, customer satisfaction, competitor actions, product innovation, etc.).

The question the list poses is how does a teacher develop these skills in accounting students?

This study summarizes proven methods to develop critical-thinking skills and show how faculty members can use these ideas in an accounting context. We also summarize Bloom's taxonomy of critical thinking and then suggest how to help accounting students to progress to higher levels of thinking. The need to develop these skills early in the accounting student's academic career so that they can master this domain-specific material in upper-level accounting courses is emphasized. Such skills should concurrently emphasize basic writing skills in separate business-writing courses and throughout the entire business program and specifically in all accounting courses. Despite pressures for many universities to increase class sizes, administrators should understand the need to keep relatively small class sizes in such critical thinking and writing courses.

A long and distinguished body of literature reflects the view that the only effective way to help develop critical thinkers is to engage them in critical thinking. Dewey (1910)

states that in order to learn to think, we must engage in thinking. Similarly, Symonds (1936) claims that students must practice thinking itself in order to improve thinking. Hunt's (1974) "match-mismatch educational model" finds that gradually withdrawing structure can enhance students' critical thinking levels, such as increasing student feedback when using case studies to explain the applications of discussed theoretical principles. To help develop their students' critical thinking skills, educators can use various approaches and structures (e.g., focus on the "whys" of certain accounting procedures and concepts). Courses that focus on rote memorization or on teaching and testing exclusively in an algorithmic fashion, e.g., many intermediate and cost accounting courses, leave little time to focus on improving critical thinking skills. However, requiring students, for example, to derive adjusting entries from partial data in new situations represents both unstructured and nondirective classroom material, which should improve critical thinking skills. It is necessary to understand the general process for dealing with this material. Harold Bloom has been helpful in theorizing about that process.

Bloom's Taxonomy

Bloom (1956) hypothesized that using higher-level (critical thinking) skills improves higher-order knowledge. For example, practitioners use higher-level application skills to complement lower-level recall skills to focus on "what" successful accountants do (to "add value" to their organizations' goals) and question the bases of acknowledged assumptions and standards.

Bloom's taxonomy (Bloom, 1956) implies that the levels of thinking are incremental, e.g., performing at Level Four is a prerequisite to move up to Level Five. Ideal readers, writers, accountants or auditors move up the levels until they can perform at top levels. To use Level Six skills, one must already possess the skills below that level. Inferring properly, for example, first requires defining and describing accurately the objects or situations from which one will infer. Skills become more complex as the levels rise. To analyze a situation, for example, is a far more complicated process than simply recalling a situation, while to evaluate a situation (using definite criteria and for a given purpose) is more complicated than either of the others. Thus, assuming constant levels of competence, the basic differences between the levels are largely a matter of attitude, not procedure.

Fowler (1998), found that Barton's (1997) questions help to implement Bloom's Taxonomy in the classroom by using certain "key" words. Barton also extends the use of key words to a list of suggested questions. Using such key words in questions helps professors teach students higher-level critical thinking skills. Some of the different levels and suggested questions that a professor can use are as follows:

Level 1: Knowledge - exhibits previously learned material by recalling facts, terms, basic concepts and answers, as in memorizing Internal Revenue Service [IRS] policies for the depreciable lives of certain classes of fixed assets, or memorizing the requirements of a specific Financial Accounting Standards Board Pronouncement.

Key words: who, what, why, when, omit, where, which, choose, find, how, define, label, show, spell, list, match, name, relate, tell, recall, select

Examples of Questions: What is . . . ? How is . . . ? Where is . . . ? When did _____ happen?

Level 2: Comprehension - demonstrating understanding of facts and ideas by organizing, comparing, translating, interpreting, giving descriptions and stating main ideas, as in comparing and contrasting IRS tax treatment for capital and operating leases for similar types of assets.

Key words: compare, contrast, demonstrate, interpret, explain, extend, illustrate, infer, outline, relate, rephrase, translate, summarize, show, classify

Examples of Questions: How would you classify the type of . . . ? What is the main idea of . . . ?

Level 3: Application - solving problems by applying acquired knowledge, facts, techniques and rules in a different way, as in describing the advantages and disadvantages of a small business electing to become an S Corporation.

Key words: apply, build, choose, construct, develop, interview, make use of, organize, experiment with, plan, select, solve, utilize, model, identify

Examples of Questions: How would you use . . . ? How would you show your understanding of . . . ?

Level 4: Analysis - examining and breaking information into parts by identifying motives or causes; making inferences and finding evidence to support generalizations, as in justifying the allocations of the market value of goodwill in a basket purchase or an acquisition relating to a purchase of a large company with many different types of assets.

Key words: analyze, categorize, classify, compare, contrast, discover, dissect, divide, examine, inspect, simplify, survey, take part in, test for, distinguish, list, distinction, theme, relationships, function, motive, inference, assumption, conclusion

Examples of Questions: What are the parts or features of . . . ? How would you classify . . . ? What ideas justify . . . ?

Level 5: Synthesis - compiling information together in a different way by combining elements in a new pattern or proposing alternative solutions, as in suggesting a long-term acquisition strategy for a company that hopes to dominate the, say, the widget industry.

Key Words: build, choose, combine, compile, compose, construct, create, design, develop, estimate, formulate, imagine, invent, make up, originate, plan, predict, propose, solve, solution, suppose, discuss, modify, change, original, improve, adapt, minimize, maximize, delete, theorize, elaborate, test, improve, happen, change

Examples of Questions: What changes would you make to solve . . . ? What way would you design . . . ?

Level 6: Evaluation - presenting and defending opinions by making judgments about information, validity of ideas or quality of work based on a set of criteria, as in considering the tax, financial and managerial implications of using stock vs. cash to acquire a large competitor.

Key Words: award, choose, conclude, criticize, decide, defend, determine, dispute, evaluate, judge, justify, measure, compare, mark, rate, recommend, rule on, select, agree, interpret, explain, appraise, prioritize, opinion, support, importance, criteria, prove, disprove, assess, influence, perceive, value, estimate, influence, deduct

Examples of Questions: Do you agree with the actions . . . ? with the outcomes . . . ? What would you recommend . . . ? What judgment would you make about . .? How would you compare the ideas . . . ?

The Elements of Critical Thinking

Another way of conceptualizing "critical thinking" is to see it as a series of decisive acts. Ennis (1962: pp. 81-111) shows that in order to strengthen their critical thinking skills and to make good decisions, individuals should understand a statement's meaning and decide whether (a) a conclusion follows necessarily from the underlying data; (b) an observation statement is reliable; (c) an inductive conclusion is warranted; (d) a statement is an assumption; (e) a definition is adequate; and (f) a statement made by an alleged authority is acceptable. A further discussion of these ideas appears below.

Deciding on a statement's meaning

At a low level, grasping a statement's meaning entails simply not mistaking its intent--being able, that is, to put the statement into one's own words without significantly altering its meaning. But moving up the levels changes the skills. For example, the formula (the statement) to determine the sum of an arithmetic series of numbers is: $(n + 1) \times (n/2)$. Being able to recall the formula (one level) and apply it (a higher level) does not prove that one knows the statement's meaning--which is that the sum of each of the pairs that can be made in the series multiplied by the number of pairs yields the sum of the whole series (Ennis, 1962: p.96). For example, in performing risk analysis for derivatives, a business enterprise's statement that it has a perfectly matched hedge is

much easier to grasp than understanding the underlying concepts of that derivative and its appropriate, complex weightings. Deriving that meaning takes a higher order of reading skill than simple paraphrase. Thus, grasping a statement's meaning implies an ability to apply the statement in situations and to recognize statements that contradict or support it. A clear and concise understanding of the meaning of this issue is essential to effective accounting and auditing research.

Deciding whether a conclusion follows necessarily from the underlying data

Deductive reasoning yields *a necessary* conclusion that must follow if its denial contradicts the assertion of the premises (Ennis, 1962; p. 87). This reasoning generally derives mathematical, "if-then" or syllogistic reasoning or other deductive reasoning rules, as when auditors ascertain that client accounts receivable balances are both reasonable and collectible before rendering an audit opinion on the (entire) financial statements. This process applies generally accepted auditing standards, which, in turn, often rely heavily upon deductive logic.

Deciding whether an observation statement is reliable

Ennis provides a "combined list of principles from the fields of law, history, and science" relating to the reliability of *observation statements*, which tend to be more reliable if the observer:

- Was unemotional, alert, and disinterested;
- Was skilled at observing the sort of thing observed;
- Had sensory equipment that was in good condition;
- Has a reputation for veracity;
- Used precise techniques; and
- Had no preconception about the way the observation turned out.

Observation statements tend to be more reliable if the observation conditions:

- Were such that the observer had good access; and
- Provided a satisfactory medium of observation.

Observation statements tend to be more reliable to the extent that the statement:

- Is close to being a statement of direct observation;
- Is corroborated;
- Is corroborate-able; and
- Comes from a disinterested source with a reputation for veracity.

Observation statements, if based on a record, tend to be more reliable if the record:

- Was made at the time of observation;
- Was made by the person making the statement; and
- Is believed by the person making the statement to be correct.

Finally, observation statements tend to be more reliable than inferences made from them.

Auditors gathering and evaluating audit evidence should apply this taxonomy. For example, externally generated data are generally assumed to be more reliable than those derived from internal sources (e.g., bank or other third-party confirmations are

more reliable evidence than internal bank reconciliations, correspondence files, or general ledger details).

Deciding whether an inductive conclusion is warranted

An inductive conclusion is an inference, a probable (but not certain) conclusion drawn from two or more premises, which can be tested by asking (1) Are the premises reliable? and (2) If the premises are considered reliable, is the conclusion convincing? Premises can be judged by whether the evidence that went into their making meets a series of criteria:

- Sufficient - Does the accountant have adequate evidence to reach a proper conclusion or should further questions be asked?
- Representative - Is the evidence provided objective?
- Relevant - Does the evidence relate directly to the provided assertion?
- Accurate - Does the evidence come from reliable primary or secondary sources?

Deciding whether a statement is an assumption

In one sense, an assumption is simply a presupposition. The statement "The Army's lack of planning caused unnecessary casualties" assumes that the Army did not plan—as well as that casualties arose, and that the casualties were unnecessary. But the lack of planning must be proved, not assumed. Since conclusions follow and depend upon assumptions, checking assumptions entails deciding if plausible and simpler alternatives exist. For example, auditors spend much time assessing the validity of client assumptions, including the adequacy of the allowance for doubtful accounts and the expected lives of depreciable assets.

Deciding whether a definition is adequate

Critical thinking always suspects persuasive definitions—those that judge a concept, as in "liberal" meaning "standing up for the right to choose" or, at the other extreme, "addicted to change." Beyond persuasion, the criterion is simply, "Is this definition good enough for our purposes in this situation?" Auditors generally consider the concepts of materiality and audit risk for a client's assertion to ascertain the sufficiency of the evidence, recognizing that the more evidence the auditor accumulates the lower the risk of misstatement. Auditors often use critical thinking processes to make these assessments, as whether the clients' explanations seem reasonable. For example, in times of higher gasoline prices, auditors of airlines should expect higher fuel costs (unless the airlines cancelled flights or had successful hedges). Thus, auditors finding relatively stable fuel costs should cause concern of the client's veracity or competence.

Deciding whether a statement made by an alleged authority is acceptable

Two questions really arise here: Is the source a (reliable) authority, and is the statement acceptable? Ennis calls an authority someone making statements in his or

her field who has studied the matter, has a good reputation, is disinterested and has full possession of his or her faculties, has followed accepted procedures to reach the conclusions, and knows that his or her reputation could be affected by his or her statements. Whether a statement is acceptable depends on accepting the person as an authority and then checking the specific statements by reference to the other five principles. The process resembles audit procedure. While auditors often rely on authorities to help satisfy the valuation assertion (e.g., using qualified appraisers to help value precious gems), they need to ascertain the authority's competence and independence and to determine how much reliance to place on the conclusions received. To aid in the process, the accounting profession has developed a hierarchy of authoritative accounting and auditing pronouncements for use in the research process.

Critical Thinking Teaching Techniques

With the modern work environment demanding ever-more critical thinking and problem solving classroom training, professors and administrators should emphasize critical thinking on their campuses, in their curricula, and in their teaching practices in order to prepare students to function effectively in today's workforce. We present an overview of the concept of critical thinking, methods of teaching critical thinking, examples of critical thinking, and references for use in college programs.

Teachers developing critical thinking skills will profit from reviewing studies that evaluate previous attempts at the task. The AECC's and AICPA also suggest that accounting students should take courses that enhance their critical thinking skills as early in the curriculum as possible. Yet, Wolcott et al.'s (2002) review of the literature notes that no study has yet properly tested the major effects of applying such critical skills. Their review of the literature, however, compliments Palomba and Banta's (1999, Chapters 4-8) discussion of the use of oral and written examinations; oral projects, simulations and class portfolios; such outside reviews of student performance as juried activities and performance evaluations on internships as well as student, alumni and employer feedback; and focus groups.

Similarly, Kimmel (1995) finds many problems in improving students' critical thinking skills, but develops a framework for this important task. Faculty can use basic, intermediate and advanced critical thinking cases, modeling, role playing, cooperative learning and short or long opinion and research papers to help their students solve unstructured, ambiguous problems by helping them focus on such critical thinking elements as tolerating ambiguity, recognizing personal biases, thinking independently, modifying judgments, listening carefully and distinguishing fact from opinion.

Friedlan (1995) measured the effects of using mini-cases and other contextual materials, with improved classroom discussions, and stressing critical thinking skill, while de-emphasizing technical materials and other standard classroom materials.

Baril et al. (1998) compared their overall scores (including firms' analyses of their own critical thinking skills) with those the interviewers gave to 31 members of (the then) Big Six CPA firms. They first found large differences in how these employers and the interview practitioners viewed or even defined critical thinking skills. They saw many practitioners over-simplify creative thinking, by, for example, focusing on identifying problems—rather than first developing expectations and then ascertaining if any new

evidence conforms or contrasts with such expectations. Practitioners also under-focused on such vital areas as recognizing when they need to gather additional evidence; fitting the found details into the overall environment of the audit; transferring knowledge among all personal and business situations; having the employee anticipate, think about, plan and otherwise "prevent audit failures before they occur."

Jenkins (1998) finds strong evidence for the need for accounting students to master critical thinking in upper-level auditing courses, as well as in introductory coursework. For example, students should review a description of some event and decide whether the entity should recognize or report this event. If they recognize the event, students must determine the affected accounts and amounts to record.

Basu and Cohen (1994) developed a student project requiring a comprehensive analysis of a publicly traded company for a management accounting course. The groups of students performed in-depth analyses of a publicly traded company's financial stability and future competitiveness. The final project (comprising 25 percent of the students' final grades) included an executive summary of the company and its position in its industry; its competitive strengths and weakness; exhibits and charts that outline its financial health; discussions of any relevant international and ethical issues; and recommendations for future operations. Basu and Cohen's measurement of results found improved critical thinking skills for these students.

Bayou and Reinstein (1997) use Bloom's taxonomy and works from Boostom (1992) and Ennis (1962) to suggest some examples of using higher-order classroom skills such as asking students to identify relevant factors in deciding whether a sole proprietor should expense or capitalize a $10,000 purchase of a building, and then asking such relevant questions as when does the purchaser expect to sell the building; what are the owners' and companies' income tax rates; and when does the proprietor plan to retire or sell the business. Bayou and Reinstein's (2001) work expands this discussion to suggest methods for teaching management accounting students to think like corporate controllers by, for example, understanding more fully the costs and benefits of the firms' intellectual assets, which firms often undervalue and under utilize.

Kern's (2000) student groups used the Internet to gather data to perform higher-level analyses of certain companies' financial statements. Kern and fellow students grade the papers based upon the groups' mastery of such higher-level skills as cooperative learning (e.g., members of the group work well together in developing its conclusions), critical thinking components (e.g., the groups properly rank the key problems and solutions in the cases). Kern found that these projects indeed strengthened students' higher order and critical thinking skills.

Houston and Talbott (1993) used Goldratt and Cox's book, *The Goal* (1992*)* to help their students focus on critical thinking skills. After completing their "real life" group cases, the students identified bottlenecks, areas needing continuous improvement—and suggestions on how to do so, and inventory and production problems. The students, companies that the students visited and the professors were all pleased with these results. An elaboration of the above example of using this book to help enhance critical thinking skills appears below.

The book describes a company that has "floundered" because it conducted its business under certain constant, time-honored assumptions, such as:

- Keep all employees busy all of the time.

- Order materials in the largest quantities possible to receive the lowest price.
- Keep the manufacturing robots working all the time (to minimize downtime).

- Measure the “cost” of an idle machine as its depreciation expense.
- Allow management to change the priority of jobs in process to meet customer pressure.

Goldratt and Cox (1992) demonstrate that the company could operate much more profitably by challenging these assumptions (i.e., by using higher-order critical thinking skills), thereby yielding dramatically improved results. They showed that adhering to these “old” policies slowed efficiency rather than enhancing it. Some “new” results included:

- Because busy employees produce unneeded inventory, thus wasting large resources, have certain production employees perform quality control and preventive maintenance rather than produce non-essential parts.
- Because large materials orders increase unnecessary inventory, order smaller quantities of parts inventory.
- Because robots, like employees, only increase unneeded inventory, consider the cost of the inventory they produce in deciding whether to allow the robots to work.
- Because “bottlenecks” often prevent a factory from working to its full potential, focus on reducing such operating bottleneck constraints.
- Because rush orders generally impair the optimal timing of the production process, alter the normal workflow for “special” jobs only rarely.

Glock (1986) suggests ways that teachers can reinforce verbal critical thinking skills by focusing greater attention on students' "why" questions than their "who," "where" and "how" questions. Teachers should also review their own methods of asking questions, questioning answers, and questioning questions, by performing some of the following techniques:

- When a student asks a “why” question, have the rest of the class discuss the kinds of questions that are most powerful and the sources of their power. Explain the structure of analytical questions. Use such questions -- especially those generated by students -- in quizzes.
- After students are accustomed to answering analytical questions using in-class materials, ask similar questions that they must answer via their own work experience or out-of-class inquiries.
- Have students analyze the information presented in the textbook to discern which forms of inquiry were used to generate it.
- Have students read critical analyses of their text, and encourage students to develop their own criticisms based on their personal experiences.
- Compare opposing positions on a topic, and help students identify the sources of the differences of opinion. Avoid emotion-laden topics until students begin to perceive the "universality of reinterpretation and redefinition."

In another example, Tripp’s (1990) second-year oral communications course students’ (1) select, define, and establish the parameters of a school-related problem; (2) analyze the problem to identify underlying causes, its scope and seriousness, and potential impact; (3) conduct a brainstorming session to generate creative solutions; (4)

assess the proposed solutions in terms of viability and potential effectiveness; (5) reach consensus on the solutions; and (6) implement the decision. This process helps to develop students' group research projects, including producing a technical report based on these efforts, where all student, group members participate in the talking, listening, gathering data, writing and editing" portions of these reports.

How College Faculty Can Help to Improve Students' Critical Thinking Skills

College programs seeking to integrate Critical Thinking across their curricula should encourage their faculty to take appropriate seminars. For example Longview Community College (1998) often offers programs that entail such key tasks and seminar topics as:

Session 1. Define "success" by particular disciplines. Just as doctors focus on accurate diagnosis and effective patient care, writing and reading teachers demand effective communication—grasp written procedures and make oneself understood. They should thus identify standards of success (usually pragmatic) and the underlying assumptions behind these standards.

Activity: Identify presuppositions - What is taken for granted in each discipline? What is important in the discipline? What is it that we want our students to learn in our classes?

Assessment: How to find whether students understand the courses basic concepts and aims? How do you correct misconceptions about what a _____ is supposed to be/do?

Session 2. Identify each discipline's patterns of successful reasoning. Attaining the goals identified in the first session requires using certain patterns of thought, which may vary across disciplines. Those teaching in the field must be "experts" in these patterns, and thus well-equipped to identify and formalize these patterns for their respective disciplines.

Activity: How do we want our students to think/solve problems/conceptualize in the discipline? Can we construct flow charts for each discipline - what is the process? How could you teach this process? Is the class designed to follow the process?

Assessment: How to test best for knowledge of these patterns?

Session 3. Identify core concepts and methods to teach these successful patterns. Develop terminologies to minimize student and instructor confusion. Students can understand better each discipline's different patterns if they use a core set of concepts as the basic referent. In addition, while the exercises and examples, which facilitate an identification of these successful thought patterns may differ, the process to identify these patterns, are often similar across the disciplines.

Activity: Introduce and discuss standardized material that can apply to almost any course - CTAC site, SmartPrim, LogicWorks.

Assessment: This is built into SmartPrim and LogicWorks - but are there other methods that are not dependent on access to technology?

Session 4. Integrating "tools of discovery" and core concepts into the curriculum requires faculty to use such standard methodologies like instructors modeling patterns for students and applying critical standards in all areas of the course (including the administration of the course). For example, students will often face classroom Socratic Questioning, practical examples and interactive web sites to help strengthen learning.

Activity: Faculty will generate at least three projects/lessons that could get students thinking critically about your subject matter - (two in class exercises and one outside of class exercise.)

Assessment: Assess that students apply the tools to situations not discussed in the book/lecture.

Summary

The need for students with critical thinking skills is now. Accounting and business professionals, whether in public accounting, management accounting, not-for-profit accounting or other management positions, provide value-added services to others, requiring students to learn to rethink; to develop lifelong learning skills to think critically (to grasp the meaning of complex concepts and principles), and to judge and apply these concepts and principles to specific issues. Colleges should recognize the importance of strengthening their students' critical thinking skills. Administrators should support their faculty in developing critical thinking programs and limiting class size so that faculty can adequately develop these skills in their students. Table 1 lists some websites and additional references to help college accounting faculty find methods to help develop their students' critical thinking skills.

Table 1 - Examples Of Colleges Using Critical Thinking Skills

1. Los Angeles Community College District using Bloom's Taxonomy in an Accounting Course: http://www.lasc.edu/uploads/pdf/Accounting1_03-04.pdf

2. California State-Northridge stresses its commitment to accept as many qualified community college students as possible, as well as its emphasizing critical thinking skills in its Intermediate Accounting courses and many other courses: http://www.csun.edu/busecon/assessment/embed_assess_03F.pdf

3. Many accounting publisher website provide detail examples of integrating critical thinking skills into the accounting curriculum, including, respectively, John Wiley & Sons, Thompson Learning, McGraw-Hill and Houghton-Mifflin:
http://he-cda.wiley.com/WileyCDA/Section/id-108035.html
http://www.thomsonlearning.com.au/higher/accounting/trotman/3e/index.asp
http://highered.mcgraw-hill.com/sites/0070910987/information_center_view0/feature_summary.html
http://college.hmco.com/CollegeCatalog/CollegeStoreController?cmd=MainProdPage&subcmd=Main&ProdId=10805.

4. Other examples of using critical thinking throughout the curriculum

http://www.surry.edu/about/ct/index.html
http://frontpage.montclair.edu/thistle/THISTLE_links.html
http://nonprofiteye.blogspot.com/search?updated-max=2006-12-12T20%3A40%3A00-08%3A00
http://www.criticalthinking.org/

5. *2004-2005 The Year of Critical Thinking: Handbook of Critical Thinking Resources,* Compiled by Bill Peirce for Prince George's Community College Faculty Members. See also: http://academic.pgcc.edu/%7Ewpeirce/MCCCTR/handbook.pdf

This Table refers to examples from community college accounting programs, senior college programs that encourage transfer students from community colleges, major accounting book publishers and other sources. Now is the time for accounting faculty to help develop their students' critical thinking skills.

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