

# **Student Assumptions About Knowledge and Critical Thinking in the Accounting Classroom**

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# **Student Assumptions About Knowledge and Critical Thinking in the Accounting Classroom**

## **Abstract**

The development of critical thinking is currently recognized as an important component of accounting education. To improve critical thinking development, several researchers have recommended that accounting professors can design more developmentally appropriate coursework if they explicitly assess and address their students' cognitive maturity, which is a function of beliefs about knowledge. Nevertheless, few accounting professors understand that students' assumptions about knowledge impact the way they respond in the accounting classroom. Without an understanding of students' assumptions, professors are likely to employ developmentally inappropriate assignments and to misinterpret their students' attempts at addressing assignments that require critical thinking (i.e., unstructured problems).

The paper first provides a summary of accounting education performance objectives for three stages of unstructured problem solving: (1) identifying the nature of the problem, (2) analyzing information and framing the problem, and (3) reaching and justifying an opinion about the most viable solution. Next, the paper describes ways in which students' assumptions about knowledge are related to cognitive development, which can cause difficulties performing at each stage of the problem solving process. The paper then offers suggestions for ways in which professors can design assignments that are likely to promote their students' critical thinking development.

## **Student Assumptions About Knowledge and Critical Thinking in the Accounting Classroom**

The development of critical thinking is currently recognized as an important component of accounting education. This paper focuses on the following types of critical thinking skills as called for by the Accounting Education Change Commission (1990, 311-312):

- ?? *Ability to identify and solve unstructured problems in unfamiliar settings and to apply problem solving skills in a consultative process*
- ?? *Ability to understand the determining forces in a given situation and to predict their effects*
- ?? *Ability to present, discuss, and defend views effectively through formal and informal, written and spoken language*
- ?? *Ability to apply accounting knowledge to solve real-world problems*

In attempting to develop such skills, many accounting professors utilize coursework requiring students to analyze *unstructured problems* (i.e., problems or cases for which there is no single correct answer). It is assumed that exposure to this type of assignment will develop students' critical thinking. However, as Kurfiss (1988, p. 51), points out:

*Discrepancies between students' and professors' assumptions about knowledge probably account for the major share of the frustration both groups experience when critical thinking is required in a course. Models of college students' intellectual development provide a framework for understanding how students come to terms with this discrepancy and what teachers can do to help.*

Consistent with Kurfiss' argument, in recent years several researchers have recommended that accounting professors assess and explicitly address their students' intellectual development so they can design more appropriate coursework (e.g., Rodgers, 1992; Francis et al., 1995; Cunningham, 1996; Wolcott and Lynch, 1997). Nevertheless, few accounting professors understand that their students' underlying assumptions about knowledge can adversely impact the

way they respond to unstructured problems. For example, many undergraduate students assume that there can be no qualitative differences across alternative arguments, and, thus, they see all points of view as having equal value. Students using this assumption cannot appropriately interpret evidence or objectively weigh alternative arguments, which are necessary components of good critical thinking. Without an understanding of students' assumptions about knowledge, professors are likely to employ developmentally inappropriate assignments and to misinterpret their students' responses to assigned problems.

Further, Das (1994, p. 335) argues that "most of our business school instructors suffer from a false sense of adequacy in their competence to help students in developing critical thinking skills." This type of overconfidence might result from a failure to recognize the limitations of student cognitive development. Thus, many professors need to learn about cognitive development in order to recognize those limitations in their students and learn to adapt their curriculum accordingly.

The purpose of this paper is to help professors better understand their students and to offer guidance about curriculum designs that are likely to enhance students' development of critical thinking skills. To achieve this purpose, the paper first describes desirable performance objectives for critical thinking in the accounting curriculum. The paper then links these objectives to typical stages of unstructured problem solving and describes ways in which students' assumptions about knowledge cause difficulties performing at each stage. Finally, the paper offers guidance to professors for identifying their students' underlying assumptions and designing coursework to help their students become better critical thinkers.

## Objectives for Critical Thinking

Before discussing the impact of cognitive development on critical thinking, this paper first provides a more complete description of the critical thinking skills we would ideally like our accounting students to have upon graduation. Several ultimate goals, as specified by the AECC, were described in the introduction to this paper. What kinds of expectations should we have for students to develop these types of skills? How do student assumptions about knowledge impact performance? At what point in the educational process should specific skills be achieved? How can professors help their students develop these skills?

To develop such critical thinking, Lynch (1996) argues that professors need to: (1) challenge their students with *unstructured problems*, which lack certainties regarding such factors as the validity and completeness of the data at hand, range of solution options, and outcomes related to various options; (2) develop a better understanding of the sequence of steps their students must learn to successfully address unstructured problems; and (3) challenge their students with developmentally appropriate and increasingly complex assignments. To do this, she suggested that professors think about appropriate solutions to unstructured problems as resulting from the following increasingly complex sets of problem solving skills:

### **Critical Thinking Skills for Addressing Unstructured Problems**

1. Skills to solve highly structured aspects of the problem
2. Ability to identify the nature of the problem
3. Tools and techniques for framing the problem
4. Capability for adequately articulating, justifying, and re-evaluating a resolution to the problem

It is not necessarily easy for students to become expert at the highly structured aspects of accounting problems (e.g., calculations, definitions, authoritative pronouncements and rules,

information search). However, this paper will not focus on such skills because they have been a major focus of accounting education research for many years and because adequate performance does not require high levels of adult intellectual development.

On the other hand, the abilities of students to adequately identify, frame and resolve unstructured problems does require the uppermost levels of adult cognitive development. These skills are the focus of this paper. Before focusing on their development, however, it is important to establish the specific nature of the desired skills. Table 1 provides a summary of accounting education performance objectives that can be used to measure the adequacy of students' critical thinking abilities to identify, frame and resolve unstructured accounting problems.

#### TABLE 1 ABOUT HERE

The objectives in Table 1 are substantially expanded from the critical thinking skills recommended in the accounting education literature. For example, the skills identified by Gainen and Locatelli (1995, Tables 9.2 and 9.3) are desired for students at the time of graduation. However, as Lynch (1996) argues, competence with earlier skills (e.g., identifying the nature of unstructured problems) precedes competence with higher level skills (e.g., articulating and justifying a resolution to unstructured problems). More importantly, students are most likely to successfully develop critical thinking when they are given opportunities to attain lower level problem solving skills before being held responsible for adequate performance with the higher level problem solving skills.

Furthermore, the progression from lower to higher level unstructured problem solving skills corresponds with adult cognitive development as described by the reflective judgment

model (King and Kitchener, 1994). In the next section, the reflective judgment model is described concerning how students' levels of cognitive complexity affect their abilities to achieve the performance objectives summarized in Table 1.

### **Reflective Judgment Levels, Beliefs About Knowledge, and Implications for Addressing Unstructured Accounting Problems**

The reflective judgment model identifies a developmental progression of seven qualitatively different sets of assumptions about knowledge.<sup>1</sup> As King and Kitchener (1994, 19) argue, “these assumptions not only affect how individuals will approach the task of defending a judgment but also how they will respond in learning environments . . .” Table 2 provides the following for Levels 3 through 5 of the model: (1) a summary of key student assumptions that are likely to hamper performance, (2) key classroom indicators of student operating level, and (3) ways in which professors can help to promote their students' intellectual growth. Although the reflective judgment model describes seven levels, this paper focuses only on Levels 3, 4 and 5 because these are most commonly observed among college students.<sup>2</sup>

TABLE 2 ABOUT HERE

The following discussion elaborates on the information contained in Table 2. The discussion is synthesized from the reflective judgment model as depicted in King and Kitchener (1994, chapter 3), the reflective judgment scoring manual (Kitchener and King, 1985), the reflective judgment model applied to a problem solving process for unstructured problems developed by Lynch (1996), and accounting classroom experiences.

### **Reflective Judgment Level 3**

#### *Level 3: Assumptions About Knowledge and Impact on Ability to Adequately Identify, Frame and Resolve Unstructured Problems*

Students operating at Level 3 of the reflective judgment model assume that knowledge is absolutely certain in some areas and uncertain in others. However, they believe that any uncertainties are only temporary. These beliefs prevent students from adequately perceiving the nature of unstructured problems. For example, such students may believe that financial accounting uncertainties will cease to exist as soon as the Financial Accounting Standards Board adopts appropriate accounting rules or as soon as a sufficient quantity of information is obtained. They fail to understand that it may not be possible to observe all economic phenomena or to understand that experts often disagree about the solution to unstructured problems. In fact, they believe it is the job of experts (including their accounting professor) to come up with the correct answer to all problems.

Because students who exhibit Level 3 beliefs fail to realistically perceive the complexities and ambiguities of unstructured problems, they are unable to adequately frame such problems. In cases where they fail to recognize uncertainty, they believe that different points of view are not legitimate. In other cases where they perceive temporary uncertainty, they believe that differences in points of view are unimportant, since the answer to an unstructured problem is not known for sure by anyone. Many of these students become disillusioned with authorities, whose views they often perceive as capricious. They are also unable to recognize qualitative differences or to evaluate evidence, and they often ignore evidence that is contrary to their own opinions.

Because of the problems described above in recognizing the nature of and framing unstructured problems, students operating at Level 3 do not acknowledge the need for them to make a judgment. In cases where they fail to recognize uncertainty, they are likely to rely on the

unexamined opinion of an expert. Such students believe it is the expert's job to tell them the "right" answer. In other cases where they believe that authorities do not yet know all the "right" answers, they tend to reach and justify their opinion based on their prior beliefs, their "feelings," or on whim, and they may readily change it. They sometimes assert that their opinion is "logical," but they do not use logical arguments to reach or to justify a conclusion.

### *Level 3: Key Indicators in the Accounting Classroom*

The type of thinking represented by Level 3 is very common among college students, especially among freshmen and sophomores (King and Kitchener, 1994, Table 6.6, p. 161). Students who exhibit this level of thinking have a strong tendency to deny ambiguity in accounting. This is particularly true in cases where their prior perception about accounting is that it is a highly structured, "black and white" subject. In fact, these students may be attracted to accounting as a major if they believe it is a highly structured discipline.

Because they often deny ambiguity and don't understand their need to make judgments, they frequently recast an unstructured problem as a highly structured one. Such students often answer a question of their own making that is qualitatively different than the one posed by the professor. For example, they might list definitions when asked to evaluate the pros and cons of alternative depreciation methods.

Without an adequate understanding of Level 3 beliefs, professors who challenge their students with unstructured problems may be frustrated by the apparent illogic of these students' arguments and by their ineptitude in addressing complex problems. Students may be perceived as being lazy or as having poor reading comprehension.

At the same time, students may be disconcerted because they do not understand why they should make a judgment, and they are easily overwhelmed by the complexity of issues in

unstructured problems. Some students are likely to wonder why the professor doesn't provide them with the "right" answer; a few may believe that the professor is hiding information from them. Others may argue that the subject has been unnecessarily complicated and that complex problems should be relegated to higher-level courses.<sup>3</sup>

### *Level 3: Suggestions for Professors to Promote Critical Thinking*

Students operating at Level 3 are likely to exhibit very poor performance if professors assign them tasks that require much higher levels of cognitive complexity. For example, these students may flounder if asked to identify evidence (other than experts' opinions) that agrees with their point of view. Instead, these students should be given assignments that require them to practice and develop the skills of the next higher cognitive development level.

As suggested in Table 2, the most important growth opportunity for these students is for them to learn that true ambiguity exists. This will assist them in identifying the nature of unstructured problems, which is a prerequisite to adequately framing or resolving such problems. To promote development, professors can help their students understand that some problems will never have a single correct answer, and it is not the professor's or any other expert's role to provide the "right" answer to all problems. An effective way to help students learn that real uncertainties exist is to expose them to evidence that experts disagree. For example, Wolcott (1997) illustrates a financial accounting teaching case in which students are given information that financial analysts disagreed about an appropriate goodwill amortization life for Blockbuster Entertainment Corp. Another important critical thinking opportunity is to ask students to explore the unstructured aspects of problems. For example, students could be asked to describe the risks and uncertainties surrounding a company's accounts receivable or to explain why it is not possible to fully know the dollar amount of costs incurred by each product in a joint production scenario.

Although students operating at level 3 are not sophisticated in their use of evidence, professors can lay groundwork for future growth by exposing these students to the use of evidence in justifying opinions. Class discussions can serve this purpose if there are students operating at higher levels who are able to articulate ways in which they identify and use evidence. Repeated exposure to a higher level of complexity exhibited by peers can be a powerful source of motivation to grow.

#### **Reflective Judgment Level 4**

##### *Level 4: Assumptions About Knowledge and Impact on Ability to Adequately Identify, Frame and Resolve Unstructured Problems*

Students operating at Level 4 have achieved important growth beyond Level 3 because they are able to recognize that some problems involve inherent and enduring uncertainties. However, their understanding is often limited; they may simplistically attribute uncertainties to a superficially narrow set of limitations.

Unlike students operating at Level 3, those operating at Level 4 begin to acknowledge the role of evidence. Unfortunately, they have not yet developed an adequate framework within which to obtain, organize and understand information about unstructured problems. Accordingly, they tend to look at problems superficially, rather than complexly and broadly. This leads to several observable weaknesses in their approach to unstructured problems. First, they are likely to confuse evidence and unsupported personal opinion. Second, they do not yet recognize that evidence must be interpreted based on qualitative differences. Third, they do not clearly recognize legitimate reasons for differences in points of view, believing that differences arise solely because of personal characteristics (e.g., upbringing, intentional bias, individualism). Fourth, they fail to recognize that experts (including professors) reach conclusions through a complex process of

identifying and interpreting evidence from a variety of legitimate perspectives; accordingly, they often view experts as being opinionated or as trying to subject others to their personal beliefs. These characteristics of Level 4 make it difficult for students to break problems down, logically organize information, weigh evidence and arguments, understand problems from multiple perspectives, and accommodate their own biases.

Because students operating under Level 4 assumptions are unable to adequately frame unstructured problems, they may disregard evidence and use whim or prior beliefs to reach and justify a conclusion. They are also likely to “stack up” evidence in a quantitative way and ignore contrary information. They often insist that all opinions are equally valid. Because of this and also because their own solution is not well supported, they may become defensive if challenged or when confronted with new evidence. Others, less settled in their conclusions, may capriciously change their position.

#### *Level 4: Key Indicators in the Accounting Classroom*

Reflective judgment model Level 4 represents the most common set of beliefs found among undergraduate college students, and it is also very common among master’s level and even some doctoral students (King and Kitchener, 1994, Table 6.6, p. 161). Many of these students view coursework as a game in which it is their job to figure out what the professor wants and then to stack up evidence to support that position.

Students operating with Level 4 assumptions tend to sound very democratic, arguing that “everyone is equal.” What they don’t understand is that human beings can be viewed ideally as equals, but individual opinions are not necessarily equal. It is these students’ democratic tendencies, driven by their inability to recognize qualitative differences among arguments or objectively evaluate their own opinions, that sometimes leads them to view professors as “unfair”

or “opinionated.” This is most likely to occur when they are challenged on their beliefs or when grades depend on the quality of their arguments.

On the other hand, these students are often interested to learn during class discussions that their peers hold a variety of opinions and have different ways of talking about and interpreting a problem. These students’ openness to information and tolerance for others’ ideas is a benefit in promoting active class discussion.

#### *Level 4: Suggestions for Professors to Promote Critical Thinking*

As before, students operating at Level 4 are likely to exhibit poor performance if professors ask them to perform tasks that are clearly beyond the reach of their level of cognitive complexity. For example, these students may perform abysmally if asked to recommend and justify an income tax strategy where there is more than one defensible solution.

As suggested in Table 2, these students need to work on developing complex tools for framing unstructured problems. Professors can initially impact these students’ development by helping them understand that evaluating an argument is not the same as making a judgment about a person. Students should then be given assignments requiring them to address various aspects of framing unstructured problems and to recognize and compensate for their own initial biases (which can cause them to ignore information that is contrary to their own point of view). Because Level 4 students do not have experience with these tasks, professors should model (or have more advanced peers model) all the factors that should be considered when framing unstructured problems. This can be achieved through brainstorming and by organizing information on the board as it unfolds during class discussion. Appropriate topics for this type of exercise might include analysis of various stakeholder points of view regarding a company’s choice among accounting methods or identification of the pros and cons of an income tax strategy.

Special attention should be given to helping these students learn to understand why some evidence is more reliable than other evidence. This is particularly important in a course such as auditing, in which students are typically held responsible for this understanding. Students can learn to recognize differences in evidence by initially having professors fully explain their own thought processes in evaluating examples of evidence and then by experiencing numerous opportunities to practice.<sup>4</sup>

### **Reflective Judgment Level 5**

*Level 5: Assumptions About Knowledge and Impact on Ability to Adequately Identify, Frame and Resolve Unstructured Problems*

Students operating from a Level 5 point of view can have a much more complex understanding of problems than those operating at Level 4. At this point, they become aware of their own limitations and biases in understanding a problem. They can also perceive how different facets of a problem lead to its complexity.

Students operating at Level 5 have achieved a major advancement because they begin to logically and qualitatively evaluate evidence and arguments. They are able to objectively examine the problem, and they believe that their own and others' viewpoints result from interpretations of information within individual perspectives. They start to understand how experts come to their conclusions via evidence and perspective.

Although Level 5 reasoning allows students to draw logical conclusions within a given perspective, they are generally unable to adjudicate across perspectives. This often causes them to be reluctant to select and defend a single overall solution as most viable, or they may select a solution but be unable to express adequate support for its superiority over other solutions. These

students are also likely to fail to recognize the need to reevaluate a solution when confronted with unexpected or updated information.

#### *Level 5: Key Indicators in the Accounting Classroom*

Although not as common among undergraduate students as the earlier levels discussed in this paper, Level 5 assumptions about knowledge are held by a fair number of senior undergraduate college students. Also, it is the most common level found among master's students (King and Kitchener, 1994, Table 6.6, p. 161).

Students operating at Level 5 are able to avoid many of the pitfalls of the earlier cognitive stages. They are able to present coherent descriptions of a problem, identify issues associated with multiple perspectives, and present logical and qualitative analyses of evidence.

On the other hand, these students often exert significant energy trying to maintain balance, which conflicts with choosing and justifying one solution as superior to other solutions. This can cause them to jeopardize class discussions that involve resolving unstructured problems because they tend to get “hung-up” on the framing phase. For example, such students might argue that they can't think about the solution to a problem until everyone agrees on definitions.

#### *Level 5: Suggestions for Professors to Promote Critical Thinking*

The biggest difficulty for students operating at Level 5 is their inability to adequately evaluate across perspectives. As suggested in Table 2, professors should model the process and then help these students develop the principles and frameworks that will help them do this on their own. For example, professors can use cases derived from Financial Accounting Standards Board deliberations (such as employee stock option accounting) to help students recognize trade-offs across perspectives in real-world decision making.

In classes dominated by students operating at lower levels of cognitive complexity, professors may not wish to devote significant class time to the developmental needs of students operating at Level 5. In such cases, professors should consider meeting with these students individually or providing them with written feedback.

## **Conclusion**

The purpose of this paper is to help professors better understand their students and to offer guidance about curriculum designs that are likely to enhance students' development of critical thinking skills. The paper elaborated on the specific impact of student beliefs about knowledge on their attempts at identifying, framing and resolving unstructured problems that require critical thinking.

A major contribution of this paper is that it will help accounting professors learn to recognize and acknowledge the legitimacy of initial student failures at desirable critical thinking objectives. Because of the importance of cognitive development level, professors should first learn how to recognize the key indicators of different underlying assumptions about knowledge held by their students. This paper provided illustrations of such indicators. Alternatively, professors may wish to assess their students' levels of cognitive complexity using techniques such as those described by Wolcott and Lynch (1997). Then, given an understanding of their students' current cognitive complexity, professors can create developmentally appropriate coursework to stimulate growth in critical thinking. To help professors with this task, this paper also provided a summary of performance objectives and described developmentally appropriate teaching assignments for students at different stages of growth.

This paper was intended to serve as a foundation for critical thinking development in the accounting classroom. Numerous future research opportunities exist. For example, how effective

are various types of coursework challenges (e.g., cases or group projects) in achieving critical thinking development? How can professors optimally seek development of students who are operating at different levels of complexity?

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**Table 1**  
**Performance Objectives for Identifying, Framing and Resolving**  
**Unstructured Accounting Problems**

	<b>Accounting Student Performance Objectives</b>
<b>Identifying the Nature of Problems</b>	<ul style="list-style-type: none"> <li>?? Understand that there may never be a single correct solution to some problems</li> <li>?? Differentiate between highly structured and unstructured aspects of a problem</li> </ul>
<b>Framing Unstructured Problems</b>	<ul style="list-style-type: none"> <li>?? Identify information related to a problem</li> <li>?? Understand when and how to apply accounting principles to unstructured situations</li> <li>?? Identify key stakeholders and alternative perspectives related to a problem</li> <li>?? Construct a complex, objective, balanced picture of a problem and the larger context within which different perspectives fit</li> <li>?? Identify a variety of evidence-based processes for examining a problem from different perspectives</li> <li>?? Recognize own initial biases and employ strategies to lessen their impact</li> </ul>
<b>Resolving Unstructured Problems</b>	<ul style="list-style-type: none"> <li>?? Use a complex framework to adjudicate logically across potential solutions to a problem</li> <li>?? Clearly articulate a position on the issue(s)</li> <li>?? Use persuasive reasons and evidence to support the position chosen</li> <li>?? Make objective and coherent arguments to counter arguments that support other viable solutions</li> <li>?? Recognize limitations of proposed solution and implications of those limitations</li> <li>?? Adapt solutions to unexpected or updated information</li> <li>?? Employ processes of inquiry that can potentially lead to new theories or solutions to a problem</li> </ul>

Note: Performance objectives were adapted Lynch (1996) and Lynch and Wolcott (1997).

**Table 2**

**Student Assumptions That May Hamper Performance, Key Classroom Indicators and Suggestions for Professors**

**Reflective Judgment Level 3**

<b>Student Assumptions That May Hamper Performance</b>	<b>Key Classroom Indicators</b>	<b>Suggestions for Professors</b>
<p>?? Uncertainty either doesn't exist or is merely temporary</p> <p>?? Experts know or will find answers to all problems</p> <p>?? Until experts can agree, any opinion is just a guess</p> <p>?? It is sufficient to view unstructured problems holistically without attention to realistic complexities</p>	<p>?? Fail to realistically perceive complexities and ambiguities</p> <p>?? Recast unstructured problem as highly structured one</p> <p>?? Cannot evaluate or properly apply evidence</p> <p>?? Ignore evidence contrary to own opinion</p> <p>?? Use illogical arguments</p> <p>?? Conclude based on prior beliefs, what "feels right," or whim</p> <p>?? Express confusion or futility</p> <p>?? Insist that professor should provide "correct" answer</p>	<p>?? Attend to students' concerns about expecting the professor to provide the "right" answer</p> <p>?? Confront students with evidence that experts disagree</p> <p>?? Ask students to:</p> <p>    ?? Consider why experts disagree</p> <p>    ?? Identify the unstructured aspects of problems</p> <p>?? Model use of evidence in justifying opinions</p>

**Table 2 (continued)**

**Reflective Judgment Level 4**

<b>Student Assumptions That May Hamper Performance</b>	<b>Key Classroom Indicators</b>	<b>Suggestions for Professors</b>
<p>?? It is sufficient to simply stack up evidence that supports one's opinion</p> <p>?? Conflicting points of view for which evidence can be provided are equally valid</p> <p>?? Uncertainty is due only to specific limitations (e.g., incorrect reporting of data, limited resources, data lost over time, inability to correctly predict the future)</p> <p>?? Criticizing an argument is the same as criticizing a person</p> <p>?? Experts (including professors) are biased persons who are simply promoting their own agenda</p>	<p>?? Confuse evidence and unsupported personal opinion</p> <p>?? Stack up evidence quantitatively and ignore contrary information</p> <p>?? Disregard evidence and use whim or prior beliefs to reach and justify a conclusion</p> <p>?? Recognize evidence and multiple perspectives, but inept at:</p> <p>    ?? Breaking problem down</p> <p>    ?? Logically organizing information</p> <p>    ?? Understanding problem from multiple perspectives</p> <p>    ?? Accommodating own biases</p> <p>?? Change position or become defensive if challenged or when confronted with new evidence</p> <p>?? Insist that all opinions are equally valid</p> <p>?? View experts (including professors) as being opinionated or as trying to subject others to their personal beliefs</p>	<p>?? Help students understand that evaluating arguments is not the same as judging people</p> <p>?? Model the factors that should be considered when framing unstructured problems</p> <p>?? Ask students to address various aspects of framing:</p> <p>    ?? Recognize their initial biases and help them develop strategies to lessen them</p> <p>    ?? Describe the context in which problems are found</p> <p>    ?? Identify information and evidence related to a problem</p> <p>    ?? Identify various points of view about the problem</p> <p>    ?? Describe arguments for and against alternative points of view</p> <p>    ?? Recognize the assumptions embedded in different perspectives</p> <p>    ?? Explore qualitative differences across types of evidence</p> <p>    ?? Develop frameworks for organizing information</p>

**Table 2 (continued)**

**Reflective Judgment Level 5**

<b>Student Assumptions That May Hamper Performance</b>	<b>Key Classroom Indicators</b>	<b>Suggestions for Professors</b>
<p>?? Endorsing one alternative denies the legitimacy of other alternatives</p> <p>?? Solutions to unstructured problems may be justified only within a given context or from a given perspective</p> <p>?? There are no overarching criteria by which to choose among competing evidence-based interpretations or solutions</p>	<p>?? Logically and qualitatively evaluate evidence and arguments</p> <p>?? Present coherent and balanced description of a problem</p> <p>?? Identify issues associated with multiple perspectives, but inept at evaluating the strength of arguments across perspectives</p> <p>?? Reluctant to select and defend a single overall solution as most viable</p> <p>?? Select a solution but unable to express adequate support for its superiority over other solutions</p> <p>?? Jeopardize class discussions by getting “hung-up” on issues such as definitions</p>	<p>?? Model process of evaluating across perspectives</p> <p>?? Help students develop the principles and frameworks to evaluate across perspectives by asking them to:</p> <p>    ?? Evaluate the relative quality of information and opinions</p> <p>    ?? Choose a solution as most viable</p> <p>    ?? Justify their belief and determine whether their belief is based on objective, qualitative evaluations of relevant information</p> <p>?? Explain how they would respond to arguments that support other viable solutions</p> <p>?? Recognize the limitations of their solution and the implications of those limitations</p> <p>?? Decide how to articulate and justify their interpretation</p>

Note: Certain key indicators are apparent for some students but not for others. Evidence of two or more key indicators suggests high likelihood that a student operates at that level. Some students operate in more than one level at the same time.

## Endnotes

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<sup>1</sup> The reflective judgment model is superior to other models of cognitive development, in particular that of the commonly-cited Perry (1970) model, because it is “more rigorously epistemological” (Kurfiss, 1988, p. 58) and has been extensively validated with cross-sectional and longitudinal data on male and female college students (King and Kitchener, 1994, chapter 6).

<sup>2</sup> According to data summarized by King and Kitchener (1994, Table 6.6, chapter 6), Levels 1 and 2 are rarely evident among college students. Although Levels 6 and 7 are sometimes found among students, the assumptions held by those students should not significantly hinder abilities to achieve the performance objectives outlined in Table 1.

<sup>3</sup> Such comments are likely to result not only from Level 3 cognitive complexity, but also from students’ experience in other college courses where they often are asked only to memorize highly structured material.

<sup>4</sup> It can be a surprisingly difficult task for professors to fully describe their own thought processes. Some practice may be necessary before a professor is able to do this at a level that is comprehensible to his or her students.