

# Hong Kong University of Science & Technology

## Illustration of Student Assignment, Handout, Self-Assessment Form, and Classroom Activities

The following series of activities were used during February 2003 in a first-year undergraduate “introduction to college” course for business majors.

- The assignment on the following page was given to students as a take-home assignment to be turned in on the first day of the critical thinking activity. Students were NOT provided with any advance instruction about critical thinking or Steps for Better Thinking.
- On the day the assignment was due, students were given the attached handout and the attached student self-assessment form.
- During class, the visiting professor (Susan Wolcott) spent 1.5 hours introducing Steps for Better Thinking and then working through the first part of the handout (which includes classroom activities involving the self-assessment form).
- For the next class period, students were asked to re-write their assignment based on their new understanding of critical thinking.
- During the next class period, student questions were addressed and then the visiting professor led students through the handout until the end of the class period. Most of the class time was spent focusing on Steps 1 and 2, based on the level of student skills as demonstrated in the first paper. There was no time to address the Step 4 part of the handout, and Step 3 was addressed only briefly.
- After the second class session, students were asked to complete a classroom assessment, in which they described what they learned and what questions they still had.
- The visiting professor gave students individual feedback on the second set of papers. She also gave the class additional information by responding to the questions students posed in the classroom assessment.

**Assignment: Hong Kong Dollar**  
**Due Date: Wednesday, 12 February 2003**

Read the following two articles:

“Deutsche Bk Calls For 20% HK Dlr Devaluation, Then Float,” by Liz Rudall and Raymond Tsoi, *Dow Jones Newswires*, January 30, 2003.

“What’s in a Peg?” *The Economist*, October 31, 2002.

**Required:**

Write a one to two page paper (on a word processor) addressing the following question:

**Should the Hong Kong Dollar Be Delinked from the U.S. Dollar?**

In your response, be sure to address the following:

- Identify and discuss uncertainties about whether the HK dollar should be delinked
- Discuss pros and cons of delinking the HK dollar
- Explain what was most important in reaching your conclusion about whether the HK dollar should be delinked
- Discuss whether it would be possible for you to change your mind about this question in the future

# **Steps for Better Thinking: Improving Your Critical Thinking Ability**

Susan K. Wolcott  
Hong Kong University of Science & Technology  
February 12, 2003

## **Definition: Critical Thinking**

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### **Exercise:**

List words or phrases that describe “critical thinking”:

## Open-Ended Problems

Throughout your educational program, your work career, and your personal and civic life you will be faced with dilemmas that have no single “correct” answer. Such dilemmas are called *open-ended problems*. Your task for an open-ended problem is to find the best—not the only—possible solution. These problems involve uncertainties or ambiguities that prevent a single correct answer. This can occur for a variety of reasons, such as the following:

- There is a range of feasible solutions
- The outcomes of various solutions are unknown
- There is only incomplete information about the problem

For example, in today’s assignment you considered an open-ended problem about whether the Hong Kong dollar should be delinked from the U.S. dollar.

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### Exercise:

List examples of open-ended problems (personal, civic, work, school).

PERSONAL:

SCHOOL:

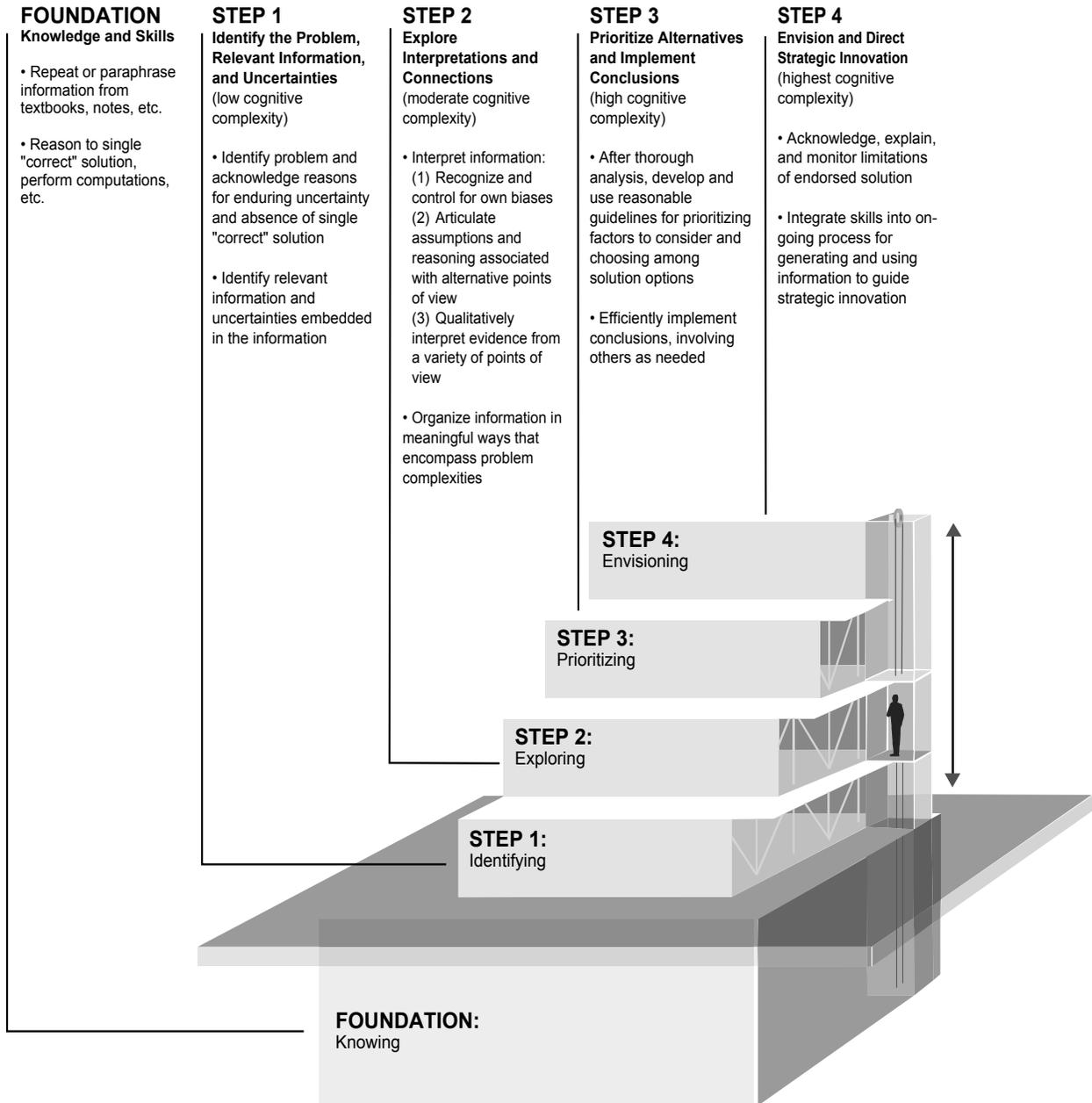
WORK:

CIVIC:



# STEPS FOR BETTER THINKING

## A Developmental Problem Solving Process



© 2002, Cindy L. Lynch, Susan K. Wolcott, and Gregory E. Huber. Permission is granted to reproduce this information for noncommercial purposes. Please cite this source: Lynch, C. L., Wolcott, S. K., & Huber, G. E. (August 5, 2002). Steps for Better Thinking: A Developmental Problem Solving Process [On-line]. Available: <http://www.WolcottLynch.com>. Model evolved from ideas presented in King and Kitchener's (1994) reflective judgment model of cognitive development and Fischer's (Fischer & Bidell, 1998) dynamic skill theory.

## Coursework Tasks and Steps for Better Thinking

Foundation—Knowing	Tasks for Open-Ended Problems			
	Step 1—Identifying	Step 2—Exploring	Step 3—Prioritizing	Step 4—Envisioning
<p><b>Demonstrating Knowledge:</b></p> <ul style="list-style-type: none"> <li>• Define _____.</li> <li>• Define in your own words _____.</li> <li>• Calculate _____.</li> <li>• Properly apply a given procedure (mathematical, statistical, or other).</li> <li>• List the elements of _____.</li> <li>• Describe _____.</li> <li>• List the pieces of information contained in _____ narrative/paragraph/text.</li> <li>• Search for specific information from the library or Internet.</li> <li>• Select the correct multiple choice answer.</li> <li>• Fill in the blank (with the correct word or phrase).</li> </ul>	<p><b>Identifying Relevant Information:</b></p> <ul style="list-style-type: none"> <li>• Distinguish between information that is relevant and not relevant for a given problem.</li> <li>• Identify relevant laws, standards or rules for _____.</li> <li>• Read articles, consult experts, and explore other resources to:               <ul style="list-style-type: none"> <li>• Identify issues/factors related to _____.</li> <li>• Identify various potential solutions to _____.</li> <li>• Describe arguments in favor of _____.</li> </ul> </li> </ul> <p><b>Identifying Uncertainties:</b></p> <ul style="list-style-type: none"> <li>• Describe uncertainties concerning _____.</li> <li>• Identify reasons why _____ might change or vary.</li> <li>• Explain why there is no single, “correct” way to _____.</li> <li>• Identify and describe uncertainties about the interpretation or significance of _____.</li> <li>• Explain why _____ cannot completely eliminate risk of _____.</li> <li>• Explain why even an expert cannot predict for certain what will happen when _____.</li> </ul>	<p><b>Interpreting Information From Multiple Viewpoints:</b></p> <ul style="list-style-type: none"> <li>• Analyze the pros and cons or costs and benefits of _____.</li> <li>• Compare and contrast _____ [theories/viewpoints/perspectives].</li> <li>• Interpret and discuss the evidence related to _____.</li> <li>• Identify assumptions and reasoning associated with _____.</li> <li>• Interpret _____ from more than one viewpoint.</li> <li>• Objectively evaluate _____ information.</li> <li>• Explore the implications of ambiguities when analyzing _____.</li> <li>• Consider the impact of alternatives on various stakeholders in _____.</li> <li>• Analyze the quality of information and evidence related to _____.</li> <li>• Recognize and control own biases when _____.</li> </ul> <p><b>Organizing Information:</b></p> <ul style="list-style-type: none"> <li>• Organize information and analyses to help you think about or to communicate _____.</li> <li>• Develop meaningful categories for _____.</li> </ul>	<p><b>Prioritizing and Concluding:</b></p> <ul style="list-style-type: none"> <li>• Develop and use reasonable guidelines for drawing conclusions regarding _____.</li> <li>• Prepare and defend a solution or explain your opinion about _____.</li> <li>• Explain how you would respond to arguments that support other reasonable solutions to _____.</li> <li>• Objectively consider _____ when making a decision.</li> <li>• Address and prioritize the costs and benefits of _____ in reaching conclusions about _____.</li> <li>• Explain which issues you weighed more heavily than other issues in arriving at your conclusion about _____.</li> <li>• Develop an effective plan for addressing _____.</li> </ul> <p><b>Effectively Involving Others in Implementation:</b></p> <ul style="list-style-type: none"> <li>• Describe how to implement the best solution to _____.</li> <li>• Communicate _____ effectively for a given setting and audience.</li> <li>• Explain how you designed your memo/presentation/_____ to effectively communicate to your audience.</li> </ul>	<p><b>Acknowledging Limitations:</b></p> <ul style="list-style-type: none"> <li>• Identify potential future developments in _____.</li> <li>• Describe limitations to a recommendation about _____.</li> <li>• Strategically consider contingencies and future developments related to _____.</li> <li>• Describe conditions under which you would reconsider your solution to _____.</li> </ul> <p><b>Monitoring and Improving Over Time:</b></p> <ul style="list-style-type: none"> <li>• Develop strategies for generating new knowledge about _____.</li> <li>• Engage in continuous improvement in _____.</li> <li>• Acknowledge changing circumstances and reconsider _____ as appropriate.</li> <li>• Establish a plan for monitoring the performance of your recommended solution to _____.</li> <li>• Manage _____ under changing circumstances or unusual demands.</li> </ul>

NOTE: The tasks in the table require you to adequately perform all aspects of Steps for Better Thinking *through* the step in which the assignment is listed. For example, if a task is listed under Step 3, then it requires performance of the Foundation and Steps 1 and 2 in addition to Step 3.

## **Foundation: Knowledge for Addressing an Open-Ended Problem**

Foundational knowledge provides you with the information you need to analyze a problem.

### **Questions You Can Ask Yourself:**

1. How can I gather information about the problem?
  2. What "textbook" information would be helpful (e.g., definitions, formulas, theories, etc.)?
  3. Have I read and understood applicable materials (e.g., textbooks, articles, etc.)?
  4. Have I used dictionaries or other resources to help me understand terminology?
  5. Have I practiced using applicable procedures, formulas, calculations, etc.?
  6. Have I asked questions of experts (including my professor), as needed?
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### **Exercise:**

What did you need to KNOW to address today's homework assignment?

## Step 1: Identifying the Problem, Relevant Information, and Uncertainties

There are three major purposes in identifying the problem, relevant information, and uncertainties: (1) to help you focus only on information that is relevant to the problem, (2) to determine whether the problem is open-ended, and (3) assuming the problem *is* open-ended, to gain an understanding of why there is no single correct solution. Step 1 of Steps for Better Thinking sets the stage for further analysis (i.e., Step 2).

### Questions You Can Ask Yourself:

1. Is there disagreement about this problem?
    - a) If not, look for more information. If I don't find any information about disagreement, the problem might NOT be open-ended (i.e., there might be a single correct solution).
    - b) If so:
      - i) What are the different opinions/solutions?
      - ii) What are the underlying uncertainties that leave room for disagreement? (This is VERY important)
  2. Why aren't any of the solutions totally "correct"?
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### Exercise:

Consider the question you addressed in today's homework assignment: **Should the Hong Kong Dollar be delinked from the U.S. Dollar?**

In your homework assignment, you were required to "Identify and discuss uncertainties about whether the HK dollar should be delinked." List uncertainties that you included in your paper:

## Step 2: Exploring Interpretations and Connections

There are three major purposes in exploring interpretations and connections related to the problem: (1) to understand and analyze important information related to the problem (including evidence and alternative points of view), (2) to recognize and control your own biases in addressing the problem, and (3) to ensure an organized and thorough analysis. Adequate performance in Step 2 of Steps for Better Thinking will allow you to adequately reach a conclusion to the problem (Step 3).

### Questions You Can Ask Yourself:

1. Do I have any initial preferences for one solution? If so:
  - a) Can I identify where my bias comes from?
  - b) How can I set my preferences aside while I study the problem?
2. For the various pieces of evidence related to the problem (arguments, theories, research, data, quotes, etc.):
  - a) What are the strengths and weaknesses of different pieces of evidence?
  - b) How can the evidence be used to support different points of view?
3. For the various points of view:
  - a) What are the arguments for and against each point of view?
  - b) What are the assumptions and biases related to each point of view?
4. How might I organize the above information to help me reach a conclusion?

HINT: When you begin to analyze/explore connections for a problem, it is often helpful to think about how this problem is similar to other problems you have addressed.

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### Exercise:

Consider the question you addressed in today's homework assignment: **Should the Hong Kong Dollar be delinked from the U.S. Dollar?**

When you began working on this assignment, did you have any preferences for whether the Hong Kong dollar should be delinked? If so, how did that affect your approach to the assignment? Write your thoughts here:

## Step 2: Exploring Interpretations and Connections (continued)

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### **Exercise:**

Consider the question you addressed in today's homework assignment: **Should the Hong Kong Dollar be delinked from the U.S. Dollar?**

In your homework assignment, you were required to "Discuss pros and cons of delinking the HK dollar." List pros and cons that you included in your paper:

ARGUMENTS IN FAVOR OF DELINKING:

ARGUMENTS AGAINST DELINKING:

### **Step 3: Prioritizing Alternatives and Implementing Conclusions**

Your conclusions should be persuasive, but also objective. In addition, you need to consider others as you implement conclusions (including communications such as your homework assignment). You can achieve these goals by: (1) supporting your conclusion with a thorough analysis of the problem (i.e., adequate performance of Step 2), (2) being sure that you are reasonable and objective in considering the various points of view, (3) explaining adequately how you weighed various options in reaching a conclusion, and (4) appropriately adapting your communication for your audience.

#### **Questions You Can Ask Yourself:**

1. Have I been objective in considering the various pieces of information and various points of view for this problem?
2. How did I decide which solution or opinion is most reasonable?
3. Which values and priorities are most important in reaching a solution/opinion? Why?
4. How can I explain my opinion/solution to other people?
5. How would I respond to arguments that support other solutions/opinions?
6. What is the most efficient way to implement my solution?
7. What is the best way to communicate with my audience?

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#### **Exercise:**

Consider the question you addressed in today's homework assignment: **Should the Hong Kong Dollar be delinked from the U.S. Dollar?**

In your homework assignment, you were required to "Explain what was most important in reaching your conclusion about whether the HK dollar should be delinked." List the factors you considered to be most important in reaching your conclusion:

## Step 4: Envisioning and Directing Strategic Innovation

Because open-ended problems have no single "correct" solution, they often need to be re-examined over time. This can occur because new information becomes available, because the importance of various factors changes over time, and so on. It is important to embrace change as a natural step in the process for open-ended problems. The best critical thinkers respond quickly to change and new threats and also visualize and take advantage of new opportunities.

### Questions You Can Ask Yourself:

1. What are the limitations of my solution/opinion? What are the implications of those limitations?
2. Is it possible to obtain additional information that would alter my solution/opinion?
3. What types of information might become available in the future that could affect my solution/opinion?
4. What other conditions might cause me to reconsider my solution/opinion?
5. What strategies could be implemented to monitor the results of my solution/opinion?
6. How can I anticipate and take advantage of future changes?

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### Exercise:

Consider the question you addressed in today's homework assignment: **Should the Hong Kong Dollar be delinked from the U.S. Dollar?**

In your homework assignment, you were required to "Discuss whether it would be possible for you to change your mind about this question in the future." List the factors you considered in responding to this part of the assignment:

## **Steps for Better Thinking: A Tool for Building Critical Thinking Skills**

Individuals with better critical thinking skills are able to make better decisions and be more persuasive. In professional settings, they are valued more highly than individuals with poor decision making skills. Individuals who recognize and control their own biases, who more thoroughly address uncertainties, and who objectively consider a variety of viewpoints, make better decisions. Although it may appear easy, these skills are difficult to develop. Great effort and much practice are required.

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### **Exercise:**

Write down ideas about how Steps for Better Thinking might change your future approach to open-ended problems.

## Steps for Better Thinking: Self-Evaluation Form

Name: \_\_\_\_\_

This self-evaluation form will help you evaluate and improve your performance on assignments such as the one you completed for today's class. For each topic, circle the rating that best describes your performance on this assignment. Then provide comments or make notes about things you could do differently in the future to improve your performance.

<b>Knowledge:</b>				
Lacked sufficient knowledge to adequately address the problem	Relied solely on prior knowledge and articles	If prior knowledge was insufficient, used other resources to gain knowledge	Relied primarily on prior knowledge and articles; used additional resources ONLY IF unable to understand information in the articles	Performed additional research to learn more about the pros and cons of alternatives for this problem
Comments:				
<b>Step 1 Identification and Discussion of Uncertainties:</b>				
Did not identify any uncertainties beyond simple lack of information or knowledge	Identified one or two specific uncertainties; provided little or no discussion	Identified a variety of specific uncertainties and explained how they affected the problem	Identified a variety of specific uncertainties and discussed their relative importance in addressing the problem	Not only identified a range of uncertainties, but also addressed ways to deal with them or to gain more knowledge over time
Comments:				

<b>Step 2 Own Biases and Overall Approach to Problem:</b>				
Proceeded as if the goal were to find the single "correct" solution	Proceeded as if goal were to stack up evidence and information to support own conclusion	Proceeded as if goal were to establish an unbiased, balanced view of different viewpoints; unable or reluctant to reach a conclusion	Proceeded as if goal were to efficiently reach a well-founded conclusion based on an objective evaluation of alternatives	Proceeded as if goal were to construct knowledge, to move toward better conclusions over time
Comments:				
<b>Step 2 Identification and Discussion of Pros and Cons:</b>				
Cited some arguments directly from readings; did not describe arguments in own words	Focused on arguments in favor of own conclusion and against the other alternative	Objectively presented pros and cons, including multiple arguments in favor of each alternative	Objectively presented pros and cons, including multiple arguments in favor of each alternative; also organized discussion to clarify most important issues	Objectively presented pros and cons, including multiple arguments in favor of each alternative; also incorporated possible future information that might influence evaluation of alternatives
Comments:				

<b>Step 3 Prioritizing Factors</b>				
Attempted to identify “right” answer	Explained reasons for conclusion	Discussed why various factors are important; unable or reluctant to identify which factors are most important	Explained trade-offs in reaching conclusion	Explained trade-offs in reaching conclusion; addressed limitations and long term issues or potential changes
Comments:				
<b>Step 4 Envisioning Changed Position in the Future</b>				
Unable to envision change or cited possible change in experts’ recommendations	Cited possible concrete change, such as proof that one alternative is better than the other	Discussed various factors that might change in the future	Discussed changes that might lead to different trade-offs in the future	Discussed changes that might lead to different trade-offs in the future; addressed how new knowledge might be acquired
Comments:				