

LEARNING TO THINK THINGS THROUGH

**A GUIDE TO CRITICAL THINKING
ACROSS THE CURRICULUM**

Fourth Edition

Gerald M. Nosich

Buffalo State College

PEARSON

Boston Columbus Indianapolis New York San Francisco Upper Saddle River
Amsterdam Cape Town Dubai London Madrid Milan Munich Paris Montréal Toronto
Delhi Mexico City São Paulo Sydney Hong Kong Seoul Singapore Taipei Tokyo

Editor-in-Chief: Jodi McPherson
Acquisitions Editor: Jodi McPherson
Editorial Assistant: Clara Ciminelli
Vice President, Director of Marketing: Margaret Waples
Marketing Manager: Amy Judd
Operations Supervisor: Central Publishing
Operations Specialist: Laura Messerly
Production Management: Jerusha Govindakrishnan
Composition: PreMediaGlobal
Cover Designer: Suzanne Behnke
Cover Image: Getty Images

Credits and acknowledgments borrowed from other sources and reproduced, with permission, in this textbook appear on appropriate page within text.

Copyright © 2012, 2009, 2005, 2001 Pearson Education, Inc., 501 Boylston St., Ste. 900, Boston, MA 02116. All rights reserved. Manufactured in the United States of America. This publication is protected by Copyright, and permission should be obtained from the publisher prior to any prohibited reproduction, storage in a retrieval system, or transmission in any form or by any means, electronic, mechanical, photocopying, recording, or likewise. To obtain permission(s) to use material from this work, please submit a written request to Pearson Education, Inc., Permissions Department, 501 Boylston Street, Boston, MA, 02116, or email permissionsus@pearson.com.

Many of the designations by manufacturers and seller to distinguish their products are claimed as trademarks. Where those designations appear in this book, and the publisher was aware of a trademark claim, the designations have been printed in initial caps or all caps.

Library of Congress Cataloging-in-Publication Data

Nosich, Gerald M.

Learning to think things through: a guide to critical thinking across the curriculum / Gerald M. Nosich.—4th ed.
p. cm.

Includes bibliographical references and index.

ISBN-13: 978-0-13-708514-9 (alk. paper)

ISBN-10: 0-13-708514-1 (alk. paper)

1. Critical thinking—Study and teaching. 2. Interdisciplinary approach in education. I. Title.
LB1590.3.N67 2012
370.15'2-dc22

2010050281

10 9 8 7 6 5 4 3 2 1

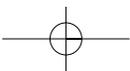
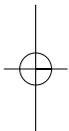
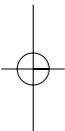


www.pearsonhighered.com

ISBN 10: 0-13-708514-1

ISBN 13: 978-0-13-708514-9

*To Matt
And to my I-Group: Mickey, Francis, Mari, Gus*



Contents

New to the Fourth Edition	xiii
To the Instructor	xvii
To the Student	xxvii

CHAPTER I

What Is Critical Thinking?	I
Some Definitions of Critical Thinking	1
Some Prominent Features of Critical Thinking	3
<i>Critical Thinking Is Reflective</i>	3
<i>Critical Thinking Involves Standards</i>	3
<i>Critical Thinking Is Authentic</i>	3
<i>Critical Thinking Involves Being Reasonable</i>	4
Three Parts of Critical Thinking	5
<i>Asking the Questions</i>	6
<i>Reasoning It Out</i>	8
<i>Believing the Results</i>	10
What Critical Thinking Is Not	12
<i>Critical Thinking and Negativity</i>	12
<i>Critical Thinking and Emotions</i>	13
Impediments to Critical Thinking	16
<i>Forming a Picture of the World on the Basis of News Media</i>	17
<i>Forming a Picture of the World on the Basis of Movies, TV, Advertising, Magazines</i>	19
<i>All-or-Nothing Thinking (Black-and-White Thinking), Us-versus-Them Thinking, Stereotyping</i>	20

vi CONTENTS

<i>Fears</i>	20
<i>Some Educational Practices Discourage Critical Thinking</i>	21
Deeper, More Pervasive Impediments to Critical Thinking	21
<i>Egocentrism</i>	22
<i>Developmental Patterns of Thinking</i>	23
<i>Previous Commitments, Previous Personal Experience</i>	24
How Deep Is Our Need for Critical Thinking?	26
<i>At the Level of Practical Decision Making</i>	26
<i>At the Level of Meaningfulness</i>	26
<i>At the Level of Concepts</i>	26
The Experience of Learning to Think Things Through Getting Started: Clarifying with SEE-I	28
<i>The Flexibility of SEE-I</i>	30
<i>Critical-Thinking Template</i>	32
An Overview of the Book That Lies Ahead	34
Some Outcomes	35
<i>Ideas for Writing</i>	37
<i>Tell Your Story</i>	38
CHAPTER 1 EXERCISES	39
	40

CHAPTER 2

The Elements of Reasoning	47
The Nuts and Bolts of Critical Thinking	48
The Elements of Reasoning	48
<i>Purpose (objectives, goals, desired outcome, intention, function)</i>	50
<i>Question at Issue (problem, topic, "the point," "Q at I")</i>	51
<i>Assumptions (background theory, what is given or what is taken for granted, axioms)</i>	52
<i>Implications and Consequences (what follows, costs and benefits)</i>	53

<i>Information (data, evidence, observations)</i>	55
<i>Concepts (organizing ideas, categories)</i>	56
<i>Conclusions, Interpretations (inferences, solutions, decisions arrived at)</i>	57
<i>Point of View (frame of reference, perspective)</i>	59
<i>Alternatives (other possibilities, options, choices)</i>	61
<i>Context (setting, background)</i>	62
<i>A Visualization</i>	63
Three Additional Elements of Reasoning	64
<i>Reasons</i>	64
<i>Claims (judgments)</i>	65
<i>Hypothesis</i>	65
<i>A Misleading Element: Facts</i>	66
How to Analyze a Piece of Reasoning Using the Elements	67
<i>Going Around the Circle: The Basic Process of Analysis</i>	68
<i>Working with the Elements: The Logic of Something</i>	68
<i>Analyzing Positions You Disagree With</i>	70
Example: Thinking Through the Logic of Getting Married	71
Trusting the Process	75
Some Outcomes	76
<i>Ideas for Writing</i>	77
<i>Tell Your Story</i>	77
CHAPTER 2 EXERCISES	78

CHAPTER 3

What Is Critical Thinking within a Field or Discipline? 86

Definitions and Parts of Critical Thinking:	
Applied to a Field	87
Thinking Biologically, Thinking Sociologically, Thinking Philosophically, Thinking Musically ...	92
The Logic of the Field or Discipline	93
<i>What Is a Field or Discipline?</i>	93

viii CONTENTS

<i>The Concept of the Logic of a Field</i>	94
<i>What Does the Logic of a Field Consist Of?</i>	95
BOX: <i>An Analysis of the Logic of Earth Sciences</i>	96
BOX: <i>Logic of Literature Course</i>	97
<i>An Analysis of the Logic of Earth Sciences</i>	96
<i>Logic of a Literature Course</i>	97
Learning the Vocabulary of the Discipline	99
<i>What Is It to Think in a Discipline's Vocabulary?</i>	100
Fundamental and Powerful Concepts	101
<i>Understanding Fundamental and Powerful Concepts</i>	101
<i>Using Concept Maps to Display Logical Connections</i>	105
<i>The Central Question of the Course as a Whole</i>	106
BOX: <i>Short Essay: Using Fundamental and Powerful Concepts to Think Through a Central Question in an Introduction to Sociology Course</i>	109
The Point of View of the Discipline	112
Impediments to Thinking Critically Within a Discipline	114
<i>Background Stories, Background Logic</i>	115
<i>School Stuff</i>	117
Trusting the Discipline	118
<i>When You Disagree</i>	123
Some Outcomes	123
<i>Ideas for Writing</i>	124
<i>Tell Your Story</i>	125
CHAPTER 3 EXERCISES	126

CHAPTER 4**Standards of Critical Thinking 133**

Clearness	134
<i>Discussion</i>	135
<i>Impediments: What's Difficult about Being Clear</i>	137

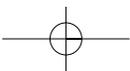
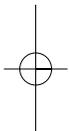
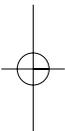
<i>How to Become Clearer</i>	138
Accuracy	138
<i>Discussion</i>	139
<i>Impediments: What's Difficult about Being Accurate and Recognizing What's Accurate</i>	140
<i>How to Become More Accurate</i>	141
Importance, Relevance	141
<i>Discussion</i>	142
<i>Impediments: What's Difficult about Focusing on What Is Important</i>	143
<i>How to Focus on What Is Most Important</i>	143
Sufficiency	143
<i>Discussion</i>	144
<i>Impediments: What's Difficult about Reasoning Through Something Sufficiently</i>	145
<i>How to Reason Things Out Sufficiently</i>	146
Depth and Breadth	147
<i>Discussion</i>	147
<i>Impediments: What's Difficult about Reasoning Deeply Enough and Broadly Enough</i>	150
<i>How to Look Beneath the Surface of Things, How to Gain a Broader Perspective</i>	150
Precision	151
<i>Discussion</i>	151
<i>Impediments: What's Difficult about Being Precise</i>	152
<i>How to Become More Precise</i>	152
Understanding and Internalizing Critical-Thinking Standards	152
Additional Critical-Thinking Standards	153
Non-Critical-Thinking Standards	153
Evaluating Around the Circle of Elements	155
<i>The Basic Process of Evaluating a Piece of Reasoning</i>	155
Critical Reading	156
<i>Reading and the Standard of Importance</i>	157

x CONTENTS

<i>Reading for Information</i>	157
<i>Reading for Pleasure</i>	157
BOX: <i>Standards Check</i>	158
<i>Reading and Listening</i>	160
Some Outcomes	160
<i>Ideas for Writing</i>	161
<i>Tell Your Story</i>	162
CHAPTER 4 EXERCISES	162
CHAPTER 5	
Putting It All Together: Answering Critical-Thinking Questions	168
The Core Process of Critical Thinking in a Discipline	169
<i>Doing More Than the Core Process</i>	171
<i>Doing Less Than the Core Process</i>	173
How Do You Fit into the Picture? Becoming a Critical Thinker	173
<i>Critical-Thinking Character Traits</i>	175
Thinking Through Important Critical-Thinking Questions	176
<i>How to Start: Begin by Stepping Back</i>	176
BOX: <i>Thinking Critically About Questions</i>	177
Q: <i>Looking at the Question</i>	181
E: <i>Thinking It Through Using the Elements</i>	184
S: <i>Using the Standards</i>	186
D: <i>Thinking It Through in Terms of the Discipline</i>	186
Critical Writing: Using the Core Process to Write a Paper	190
<i>The Work of Critical Thinking</i>	195

CONTENTS xi

Some Outcomes	195
<i>Ideas for Writing</i>	196
<i>Tell Your Story</i>	197
CHAPTER 5 EXERCISES	198
Responses to Starred Exercises	205
Notes	214
Index	218



New to the Fourth Edition

One goal of this new edition is to expand the emphasis on the critical writing that is so important a part of learning to think critically in a discipline. A second goal is to make the book clearer, more sharply focused, and more up to date. A third goal (actually a goal since the first edition) has been to make the book short enough (a) to function as a guide for students who may well have extensive discipline-based materials to work through in addition, (b) to allow students, if possible, to read the whole book near the beginning of the semester (see pages xxvii–xxviii), and (c) simply not to look daunting. Accordingly, though new sections have been added to each chapter, this edition is shorter than the previous two.

- **Ideas for Writing.** In keeping with a greater emphasis on critical writing, there is a new section at the end of each chapter on “Ideas for Writing.” This section suggests topics or questions from the chapter or the book as a whole for students to write about in a short assignment, a longer essay, or in their journal. The section also prompts students to come up with similar ideas for writing on their own.
- **Tell Your Story.** A section at the end of each chapter asks students to reflect on and write about their own personal history, their own story, with respect to critical-thinking or discipline-based concepts. For example, a topic in Chapter 1 is “Egocentrism as an Impediment to Critical Thinking,” and a question in the “Tell Your Story” section asks: “Think of your life as a whole. How has your own native egocentrism changed in your life from childhood to the present?” Or in Chapter 2: “How have your *goals* and *purposes* changed over the course of your life?” Or in Chapter 3: “What is your attitude toward the discipline you are studying? How has your attitude toward it changed over the years, maybe even before you ever took a course in it? What are some factors that might help you personally to become more open to it?” (Note that writing about the “Tell Your Story” questions may not always involve *critical* thinking. Rather, the questions ask students to engage in *reflection* on their lives in a way that lays a foundation for further *critical* reflection, after

they have learned to use the elements, the standards, and the discipline itself.)

- I have gone over each sentence of the third edition to make the book more compact and more streamlined. I have made changes, including substantial cuts, to virtually every page. These changes not only made the book shorter, but allowed the addition of new sections as well.
- I have made extensive revisions to Chapter 5. In addition to making explanations more focused throughout, I have (a) completely revamped the section on Thinking in Systems and (b) incorporated “thinking in the discipline” directly into “The Core Process of Critical Thinking” (see page 169). This latter change removes some of the separation between *critical thinking* and *critical thinking in a discipline*. It emphasizes the idea that, in any question where the disciplines are relevant (and that in the end includes most questions), I need to incorporate concepts from the discipline into my thinking.
- The critical-thinking character traits are now introduced in a single, focused subsection, instead of being mentioned piecemeal, one or two at the end of each chapter. Logically, it is now part of the section “How Do You Fit into the Picture? Becoming a Critical Thinker.”
- Over 70 percent of the discipline-based textbooks used in examples and exercises have been updated, eliminated, or changed to texts published after 2006.

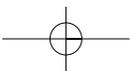
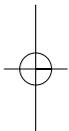
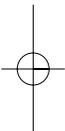
Another thread of the fourth edition further emphasizes the theme of “believing the results of one’s reasoning”—internalizing ideas learned in class and importing them into one’s ordinary life, making them part of one’s reality. Helping students learn to do this (and even to do it habitually) is, for me, one of the great challenges of teaching. In several places in the fourth edition, a question is asked in ordinary, everyday language, for example:

Suppose you are selling your car to a man who doesn’t know much about cars, and he is willing to pay you much more than you know the car is worth. What should you do?

Then the question is asked again, this time specifically from the point of view of the discipline, for example in an ethics course:

Address the following from either a rights perspective or a consequentialist perspective, or both: Suppose you are selling your car to a man who doesn’t know much about cars, and he is willing to pay you much more than you know the car is worth. What should you do?

The point is that these are not two separate questions. They are, at the very least, closely related. In many cases they are really identical (or should be identical, if I take the discipline seriously). The intent here is to help break down the barrier between what is learned in school (“school stuff” page 117 and the reality of everyday life. (See the box on pages 120–121, exercises 3.10, 5.11, 5.12, as well as several sections and exercises retained from earlier editions.)



To the Instructor

This book is a guide for learning to think critically in a discipline, a subject matter, an area, or a field of study. I use these terms more or less interchangeably throughout the book. The book applies to disciplines taught at any level of generality, at any educational level. This includes courses in humanities, social and natural sciences, business, arts, nursing, professional areas, the freshman experience, and so on, as well as multidisciplinary courses.

I specifically mean to include courses that emphasize *doing* as well as *understanding*: Composition courses stand out in particular. (There are exercises suitable for student writing, and the text promotes full integration of the composition course with other courses students are taking, across the curriculum.) But the book applies to *any* discipline that emphasizes mindful *doing*: physical education, nursing, business, math, veterinary science, agriculture, foreign languages. (In fact, in the purest sense, all courses emphasize doing: learning physics is learning to *do* physics—learning physics is learning how to engage actively in the process of thinking one’s way through the physical world.)

Although this book was not written to be the main text in a course specifically in critical thinking, I have used it that way in my own courses, and many teachers of critical thinking have used Richard Paul’s model in their courses (see page xx). In my own critical-thinking courses, I have asked my students to use the model to analyze and evaluate newspaper editorials; to apply it to problems in their personal lives; to analyze their relationships with other people; to analyze, compare, and evaluate news sources and advertising; to evaluate their own study skills; to think through their own egocentric and sociocentric tendencies; to think through artworks and a wide variety of other topics. Several times the only other texts required in my course were ones from *other* courses the student was taking. There, the goal was to help the students learn to think through the disciplines or subject matter they were studying in those other courses. What permits this diversity is the great flexibility of Paul’s model of critical thinking.

This book is a guide to critical thinking in the curriculum and intended to be inexpensive, so it can be used economically as an

xviii TO THE INSTRUCTOR

adjunct text in a course. I have tried to keep it short enough so students can be required to read it all the way through near the beginning of the semester. That way they can refer to it again and again, applying specific critical-thinking concepts to different parts of the subject matter as the course moves along, gradually coming to integrate those parts. *Learning to Think Things Through* works best, I believe, when used in a course in conjunction with subject-matter materials, including textbooks or readings brought in by the teacher or the students. "Readings" can include video or audio material of any sort, chapters, specific problems, case studies, primary sources, journal articles, or virtually any outside material. Many questions in this book direct students to apply critical-thinking concepts to the texts in the course.

Many teachers in a field or discipline want their students to learn to think critically about the subject matter they are studying and to learn to think about the world in terms of that subject matter. They want their students not to be passive recipients of information absorbed from the teacher or the text. Rather, teachers want their students to become active learners who pay attention to crucial elements of reasoning, such as assumptions, purposes, implications, and consequences, and who do this in a way that meets high intellectual standards. This book will help accomplish those goals.

Using *Learning to Think Things Through* in a Course

Teachers can use this book in a range of ways. I favor using the text as a highly integrated part of the course as a whole. The goal, again, is to keep students actively thinking their way through the course and the subject matter, rather than sinking back into being passive recipients.

As the teacher, I can have them identify key concepts of the discipline for each chapter, unit, lesson, lecture, and presentation. I ask them to construct applications of the concepts from their own experience, integrate the concepts, and draw up concept maps. Students can be given frequent practice at formulating key questions, finding relevant information and evaluating its significance, and searching for alternatives. I can have the students analyze readings or important course material right from the beginning of the course. The model of SEE-I (pages 30–33) is particularly valuable in helping students learn to clarify and deepen their understanding of *anything* in the course; it also helps students' note taking and review for exams; for the teacher, it provides a flexible way to assess students' understanding, both informally and on exams. (In my own courses, a substantial portion of my tests asks students to state, elaborate on (in their own words), give an original example and an illustration of the important concepts or ideas in the course. It has transformed my exams.)

In addition to giving students ongoing practice at thinking critically within the discipline, activities such as these furnish you with valuable insight into where exactly your students are in the course. These activities can be done in group work or individually, in class or as homework assignments, in written or oral form, with or without specific feedback from you. Activities such as these and many others are identified in *Learning to Think Things Through*, and exercises on such thinking activities appear at the end of each chapter.

This book can be used in courses in any number of other ways. You can have students work through the book on their own. Assigning exercises at the end of each chapter (some of which have suggested answers) can significantly help students in their critical thinking with minimal input from you.

Many teachers find it valuable to devote some class time to helping students learn how to assess their own work and the work of fellow students, giving one another critical feedback on the thinking. The elements (Chapter 2) and standards (Chapter 4) are an ideal vehicle for this. Devoting this class time, even though it might seem at first glance to cut down on the amount of time devoted to teaching the discipline, allows you to give frequent short written assignments throughout the semester (shown to be highly effective in helping students retain and internalize the discipline) and to make sure students receive at least some feedback on them. Having students assess one another's work does this without increasing the amount of valuable time you spend on reading and correcting student assignments. In my classes I often keep copies of student responses that apply a critical-thinking concept to a discipline. After getting permission from those students, I pass out their responses (anonymously) to students in subsequent classes. The brunt of learning is placed where it ought to be, as a responsibility of the students themselves. You are then freer to become the resource and the facilitator of learning.

The elements, standards, and subject-matter concepts make this task of self-assessment focused and beneficial both for the student being assessed and the student doing the assessing. Both are engaged in doing critical thinking about the subject matter. This book contains exercises specifically on such self-focused assessments, and many more can be readily constructed from the elements and standards.

Consider a simple example. One of the elements is *purpose*, and one of the standards is *clearness*. In my courses, I give frequent written assignments. For each of them, I ask students to write down at the top what, in their best judgment, is the purpose of the assignment. This exercise in and of itself helps students to focus their thinking (and to be aware that the assignments in fact *have* a purpose—sometimes a surprise). Then I ask students, in pairs or in groups of four, to assess how *clearly* each statement of purpose was written.

XX TO THE INSTRUCTOR

That gives students specific critical-thinking feedback on an important standard, and the clarity of their responses almost invariably improves. Similar feedback can be given from student to student about any of the elements and any of the standards.

One further note on using *Learning to Think Things Through*: the model presented here is highly integrated, and there is great benefit in having students read the entire book near the beginning of the course, rather than piecing it out as the course progresses. The flexibility and comprehensiveness of the model are not as available to students when they learn one part at a time and then try to get a sense of the whole. After getting a sense of the whole, students can then work on those aspects that give them difficulty.

The Model

This book, built on Richard Paul's model of critical thinking, is intended as a short, connected presentation, suitable for use in a subject-matter course. Essential parts of it are set forth in Paul and Elder's *Critical Thinking: Tools for Taking Charge of Your Learning and Your Life*¹ and in *Critical Thinking: Tools for Taking Charge of Your Professional and Personal Life*.² The model is the one Paul, Linda Elder, I, and a number of other workshop facilitators at the Foundation for Critical Thinking, have used in workshops and academies over the years.

The model has quantitative empirical backing. Jennifer Reed, in her doctoral dissertation, tested Paul's model in history classes at the community college level. It fared well not just compared to a didactic course in history, but also compared to an alternative model of critical thinking where the key concepts were taught implicitly rather than explicitly (with no significant differences in knowledge of history content).³

Two parts of this model form the core of this book:

- 1. Elements of reasoning.** These are the central concepts of reasoning itself. Paul often describes them as the "parts" of thinking. When I reason through something, I may be trying to do any number of things: I may be trying to see the *implications* of holding a certain *point of view*, for example, or I may be trying to come to some *conclusion*, based on certain *assumptions* I start out with. I may be deciding that I need more *information* to decide this *question at issue*. I may simply wonder what my *purpose* is in a certain venture and what my *alternatives* are. The elements of reasoning extract the common concepts from this virtually unlimited set of reasoning activities. Thus, to learn to reason is to come to mastery of concepts like implications, points of view, conclusions, assumptions, information, question

at issue, and purpose. Concepts such as these are elements of reasoning. Chapter 2 is devoted to the elements.

- 2. Standards of critical thinking.** It can be seriously misleading to say critical thinking is learning how to think. Critical thinking is learning how to think *well*. It is thinking that meets high standards of quality. Again, I can think through something well in many ways. I can figure out that one conclusion is more *accurate* than another. I can see implications more *clearly* than I saw them before. I can focus on the most *important* aspects of a problem. I can realize I have thought through an issue *sufficiently*, and now it is time to act. The standards are an attempt to formulate the heart of what constitutes the quality component in critical thinking. Like the elements, the standards are a set of concepts. I think through an issue *well* when I think it through accurately and clearly, when I focus on what is most important to deciding the issue, and when I think it through sufficiently. To learn to reason well is to come to mastery both of the elements and of standards such as accuracy, clearness, importance, and sufficiency. Concepts such as these are standards of critical thinking. Chapter 4 is devoted to the standards.

The general injunction, then, in Paul's model, is this:

Take any problem, in any area, and think it through using the elements of reasoning and in accord with the standards of critical thinking.

Developing a greater ability to think in terms of the elements and standards promotes a flexibility that is ideally useful, and maximally transferable, in teaching for critical thinking in a subject-matter course anywhere in the curriculum.

In *Learning to Think Things Through*, both elements and standards are applied to thinking within the discipline. Part of this, in any field, is learning to think the way someone in that discipline thinks. That means being able to think in terms of specific systems taught in the discipline (Chapter 5). More than that, it means being able to think in terms of those fundamental and powerful concepts and central questions that lie at the heart of the discipline, and to view the world at large from the point of view of the discipline. These are described in Chapter 3.

My presentation of Paul's model differs from his in a few respects. I have added *context* and *alternatives* to his eight elements, and I have given only the briefest introduction to intellectual traits, such as intellectual courage and intellectual humility.

Putting It All Together

A general picture is presented in Chapter 5. It is a picture of the core process of critical thinking, of answering critical-thinking questions in the subject matter. It is tagged by the acronym **QEDS**. You begin by looking critically at the **q**uestion being asked (Q). You think it through using the **e**lements (E) and the central concepts and questions of the **d**iscipline (D). You assess and revise your thinking using the **s**tandards (S).

This core process, common to all areas of thinking, is what makes critical thinking transferable. By internalizing it in your course, students can learn to think more effectively in other courses, in the interconnections between disciplines, and in their lives as related to the disciplines.

Critical Writing Across the Curriculum

An emphasis on critical writing runs through the book. It is addressed in the text, in insert boxes in chapters, in any number of exercises (of course, you can easily change pure writing assignments to group discussion questions), in new sections added to the fourth edition, and in a model for "Using the Core Process to Write a Paper."

A Note on the Exercises

A number of key guiding concepts run all the way through *Learning to Think Things Through*, and students can be assigned to apply them to the discipline again and again, in many different ways. There are exercises on each of them:

- individual elements, or the elements assembled into a circle
- the standards individually, or as a standards check
- evaluating around the circle
- SEE-I (state, elaborate, exemplify, illustrate)
- fundamental and powerful concepts
- the central question
- the point of view of the discipline
- impediments to critical thinking
- thinking in systems
- critical writing
- raising good questions
- reasoning things out
- believing the results
- intellectual traits of a critical thinker

You can also, independently of the exercises, give students assignments that require them to apply these guiding concepts to *anything* in the course: to their writing, reading, experiences, theories, research,

and so forth. These can be assigned at any point in the course, even before students have read about them in *Learning to Think Things Through*, or long after they have finished reading it. (I myself would like to see questions based in these key guiding concepts as the central part of a capstone course, requiring students to bring together insights from courses across their whole educational experience.)

The exercises in each chapter have a section called “Daily Practice: At incorporating critical thinking into your life and your learning” (see the instructions on pages 44–45). I’ve tried in these sections to address what I think is a difficult problem in student learning: to help students start to do the subtly hard work of generalizing these concepts and organizing their understanding of the world in terms of them, and to do this in an ongoing way that doesn’t stop as soon as they leave the classroom.

Teachers of physics see forces and energy at work everywhere. Teachers of sociology see social forces at work everywhere. Both kinds of force are obvious, unavoidable. But I believe we sometimes underestimate how radically different that is from students’ experience. This is not really a remark only about students. I believe it is a remark about almost all of us. Teachers of physics are not in the habit of seeing social forces at work all around them. Teachers of sociology are generally not explicitly noticing the physical forces that are omnipresent.

This is subtle because many students can often do this kind of generalizing if the instructor *prompts* them the right way: “Find three examples of social forces in your life.” But that doesn’t mean they will do the generalizing themselves unprompted. Many of the fundamental and powerful concepts in courses—and this includes critical-thinking concepts—are alien to students’ experience in this sense: students have years of seeing families just as families, as if that category was sufficient in itself. If I’m teaching the social structure of the family, my hope is that they will start to see families in terms of social forces—and that they will do so on their own, in an ongoing way, unprompted by me except at the beginning. There is a sense in which, as a teacher, what I am aiming for is nothing less than a transformation, at least a small one, in the way they view their own experience. I want them to see the world in terms of critical thinking and the discipline. Thus, the “Daily Practice” sections are an attempt to ask students to spend some time each day doing whatever they ordinarily do—but to conceptualize it in terms of one of the guiding concepts just listed: to filter the world through the elements, standards, and concepts of the discipline.

In addition to those specific sections, some other exercises work the same way. They can be assigned to students more than once during the course, thus fostering intellectual perseverance and allowing them to rethink earlier conclusions they came to, so their responses

xxiv TO THE INSTRUCTOR

can change and deepen. These exercises can be applied at any time in the course (even as a pre-test before the appropriate reading has been done), to virtually any topic, in the discipline or to students' lives outside school:

- Exercises 1.1, 1.7, 1.10, 1.14, 1.18, 1.19
- 2.1–2.3; each of the exercises on individual elements: 2.4–2.13; 2.16, 2.17, 2.18
- 3.7, 3.9, 3.11, 3.15, 3.17, 3.21
- 4.2, 4.3, 4.5, 4.7, 4.9, 4.11–4.14, 4.16
- 5.1 a b c d; 5.13, 5.16, 5.18

How to Contact Me. If you have questions about *Learning to Think Things Through*, or if you are just willing to share how you use it in your classes, I would appreciate hearing from you.

Dr. Gerald Nosich
 Department of Philosophy
 Buffalo State College
 1300 Elmwood Avenue
 Buffalo, NY 14222
 E-mail: gnosich@uno.edu

Acknowledgments

It is a pleasure to express my gratitude to Richard Paul and Linda Elder. I told Richard I would “try on” his model for a year (1991–92). At the end of the year, I found it had transformed not just the way I taught critical thinking but the way I thought about my life as well. My debt to Richard and Linda goes well beyond this book. Every time we meet I look forward to the vivid, focused intellectual conversations the three of us have. They have been my close friends for many years.

I am greatly indebted to any number of thinkers I have worked with and been close to: A. J. A. Binker, Mike Donn, Bill Dorman, John Christman, Bob Ennis, Edward Johnson, Ralph Johnson, Ann Kerwin, Marybeth Oliver, Marlys Witte; to those who also gave me their time and critical-thinking examples during the writing of this manuscript: Anne Buchanan, Francis Coolidge, Randall Curren, John Draeger, Ines Eishen, Jerel Fontenot, George Hole, Jennifer Reed, Ian Wright; to Kerry Rubadue; to Jean Von Ah, who gave me help and encouragement at the beginning of this project; and to the students in my critical-thinking and BSC 101 classes.

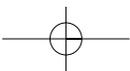
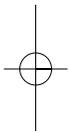
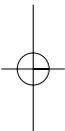
I want to thank the reviewers of the first and second editions for their encouraging and invaluable commentary: Jean Chambers, SUNY–Oswego; Paul Grawe, Winona State University; Jim Pollard,

TO THE INSTRUCTOR **XXV**

Spokane Falls Community College; Susan Quarrell, Lehman College; and Carolyn Vitek, St. Mary's University of Minnesota. I would also like to thank my editor at Prentice Hall, Sande Johnson.

Any inaccuracies or questionable assumptions in this book are my own.

For deep personal support, I want to thank not only Richard Paul and Linda Elder, but also Ralph Johnson, Matthew Nosich, Andy McCaffrey, Nicole Fargo, and the members of my I-Group, Spirit Group, and NOMC.



To the Student

The aim of this book is to help you improve your critical thinking about the subject matter of the courses you are taking. A secondary goal, a by-product of the first, is to help you improve your ability to think effectively in your life as a whole. The way you use this book is likely to be different from the way you use most books in courses.

First, this isn't a book you can just read through. You can't get stronger by *reading* about how to exercise. In the same way, you can't get better at critical thinking merely by reading about critical thinking—not even if you're very intelligent. You have to *do* it. You have to take problems or questions the text asks and actually think them out as you work your way through the book—at least some of them. In addition, it helps if you can get feedback on your thinking. You have to do this again and again.

What this book teaches is not a body of information. If the book is successful for you, you will learn to *do* something that requires more than just learning information, and more than just learning skills. It is not just about *how* to think critically—it is about *actually thinking* critically.

Learning to do something cannot be accomplished just by reading about it. You can't get thinner merely by reading about dieting; your basketball game won't improve merely by hearing about how to shoot free throws. Your writing won't improve merely by learning that you have to consider your audience—you actually have to *consider* your audience. To improve the way you do something takes both instruction (in this case, reading the book, receiving feedback) and practice (doing it).

Second, depending on what your instructor says, you may need to read the book all the way through right near the beginning of the course, including doing the thinking work. That's because the book gives a unified overall model for critical thinking, and you have to see how the parts all fit together. In the model presented in this book, you think in terms of the elements of reasoning (Chapter 2), the subject you are studying (Chapter 3), the standards of reasoning (Chapter 4), and putting it all together (Chapter 5). You need a grasp of the whole model to think your way through questions in the discipline. In the

xxviii TO THE STUDENT

end, the book promotes a different way of approaching the world—by thinking your way through it.

In some fields you proceed step by step, learning a skill well, and only then going on to the next skill (and hoping you don't forget the first one on the way). Critical thinking is different. A major goal of critical thinking is always to keep the whole in mind as you are working through the parts.

So, with this book, it is better to work all the way through to the end and get the big picture, even if there are some glaring gaps in your understanding. (That's probably the way you learned almost all complex skilled activities, particularly those that are important in your life: you don't learn to drive by first mastering the gas pedal and only later starting to work on how to use the brakes. The same is true of shopping for groceries, learning to dance, raising children, and understanding yourself and others: you engage in the process *as a whole*, gradually filling in gaps, sometimes making mistakes, improving, coming to insights within the process.)

Third, *Learning to Think Things Through* is not a book you can work through once and then be done with. Instead, you'll have to refer back to it whenever problems arise for you. After working all the way through it the first time, there *will* be glaring gaps in your understanding of various aspects of critical thinking. When you have trouble with assumptions, for example, you need to reread the section on assumptions in Chapter 2. But also look in the index under "assumptions" for other passages that may help. Do some of the exercises on assumptions, especially those that are starred (*) and have suggested answers in the back of the book. At the end of the course, some parts will still be unclear and confusing. Even so, you can still use the model as a whole. It will still be practical: in the course you are taking, in other courses, and in decisions you have to make in your own life.

Fourth, this is a guide to thinking critically within the discipline you are studying: composition, geology, educational psychology, business—any field or subject matter. Only a fraction, if any, of the examples in the text and exercises, however, will be from the discipline you are actually studying. It is still vitally important that you work your way through them. They have been selected so as to convey critical-thinking concepts across the curriculum, for all disciplines.

No technical knowledge is presumed in this book. Except for the discipline you are currently studying, you are not expected to know the specific field being discussed.

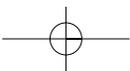
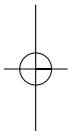
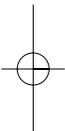
Critical thinking *transfers*. If you consciously learn critical-thinking techniques in one field, you may have those techniques available for another field. By the end you may find your learning in your other

courses becomes faster, more in your control, more lasting, and more beneficial for your life outside school.

Finally, in the end you will have to be the judge of whether using the model here improves your thinking. Certainly it won't be all or nothing. Critical thinking is a matter of degree. At the end of the course you should find yourself more often checking for accuracy, identifying assumptions, drawing relevant conclusions, thinking questions out in terms of the fundamental and powerful concepts of the discipline you are studying.

One way to think about the process is to imagine yourself in the hands of a good coach, a critical-thinking coach. This book is the manual the coach is asking you to follow, and the coach will give you feedback along the way.

Who is the coach? Well, in a way, it is your instructor. On a much deeper level, though, it is the healthy, thinking organism within you. In the end, you are going to accept processes and thinking guidelines only if they work for you. You will have to see them pay off—in your studies, in your grasp of the subject matter, in your understanding of your relations with other people—before you incorporate them into your life. But you first have to give them a chance to see if they do pay off.



For Students!

Why is this course important?

This course will help you transition to college, introduce you to campus resources, and prepare you for success in all aspects of college, career, and life. You will:

- Develop Skills to Excel in Other Classes
- Apply Concepts from College to Your Career and Life
- Learn to Use Media Resources

How can you get the most out of the book and online resources required in this class?

Purchase your book and online resources before the First Day of Class. Register and log in to the online resources using your access code.

Develop Skills to Excel in Other Classes

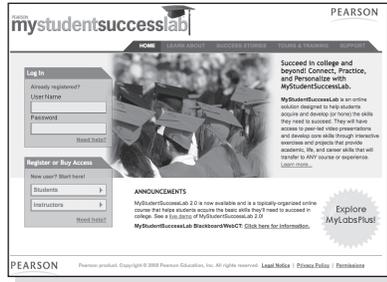
- Helps you with your homework
- Prepares you for exams

Apply Concepts from College to Your Career and Life

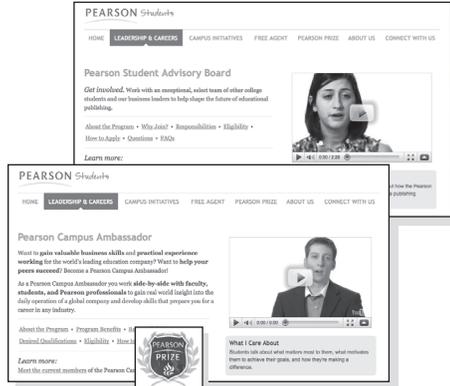
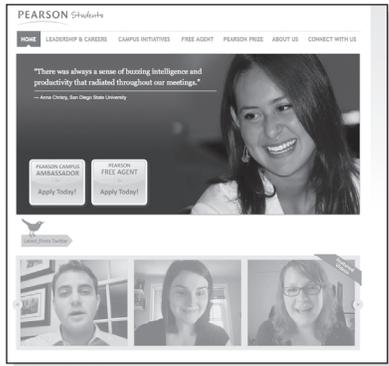
- Provides learning techniques
- Helps you achieve your goals

Learn to Use Media Resources

- www.mystudentsuccesslab.com helps you build skills you need to succeed through peer-led videos, interactive exercises and projects, journaling and goal setting activities.
- Connect with real students, practice skill development, and personalize what is learned.

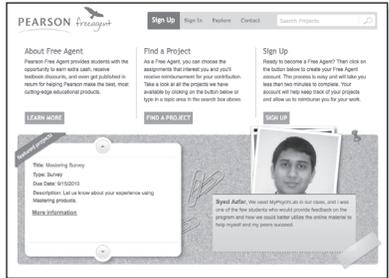


Want to get involved with Pearson like other students have?



Join www.PearsonStudents.com

It is a place where our student customers can incorporate their views and ideas into their learning experience. They come to find out about our programs such as the **Pearson Student Advisory Board**, **Pearson Campus Ambassador**, and the **Pearson Prize** (student scholarship).



Here's how you can get involved:

- Tell your instructors, friends, and family members about **PearsonStudents**.
- To get daily updates on how students can boost their resumes, study tips, get involved with Pearson, and earn rewards:
 - Become a fan of **Pearson Students on Facebook**
 - Follow **@Pearson_Student on Twitter**
- Explore **Pearson Free Agent**. It allows you get involved in the publishing process, by giving student feedback.

See you on **PearsonStudents** where our student customers live. When students succeed, we succeed!



**Succeed in college and beyond!
Connect, practice, and personalize with MyStudentSuccessLab.**

www.mystudentsuccesslab.com



MyStudentSuccessLab is an online solution designed to help students acquire the skills they need to succeed. They will have access to peer-led video presentations and develop core skills through interactive exercises and projects that provide academic, life, and career skills that will transfer to ANY course.

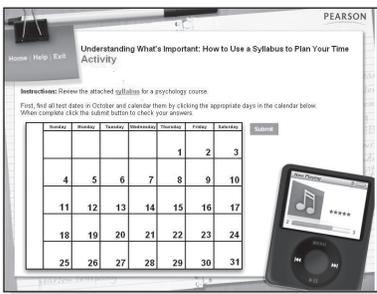
It can accompany any Student Success text, or be sold as a stand-alone course offering. To become successful learners, students must consistently apply techniques to daily activities.

How will MyStudentSuccessLab make a difference?



Is motivation a challenge, and if so, how do you deal with it?

Video Presentation – Experience peer led video 'by students, for students' of all ages and stages.



How would better class preparation improve the learning experience?

Practice activities – Practice skills for each topic - beginning, intermediate, and advanced - leveled by Bloom's taxonomy.



What could you gain by building critical thinking and problem-solving skills in this class?

Apply (final project) – Complete a final project using these skills to create 'personally relevant' resources.

MyStudentSuccessLab Feature set:

Topic Overview: Module objectives.

Video Presentation - Connect: Real student video interviews on key issues.

Practice: Three skill-building exercises per topic provide interactive experience and practice.

Apply - Personalize: Apply what is learned by creating a personally relevant project and journal.

Resources: Plagiarism Guide, Dictionary, Calculators, and Assessments (Career, Learning Styles, and Personality Styles).

Additional Assignments: Extra suggested activities to use with each topic.

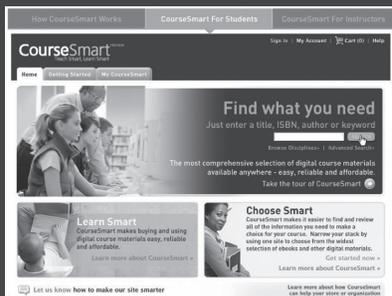
Text-Specific Study Plan (available with select books): Chapter Objectives, Practice Tests, Enrichment activities, and Flashcards.

MyStudentSuccessLab Topic List -

1. Time Management/Planning
2. Values/Goal Setting
3. Learning How You Learn
4. Listening and Taking Class Notes
5. Reading and Annotating
6. Memory and Studying
7. Critical Thinking
8. Problem-Solving
9. Information Literacy
10. Communication
11. Test Prep and Test Taking
12. Stress Management
13. Financial Literacy
14. Majors and Careers

MyStudentSuccessLab Support:

- **Demos, Registration, Log-in** - www.mystudentsuccesslab.com under "Tours and Training" and "Support."
- **Email support** - Send an inquiry to MyStudentSuccessLab@pearson.com
- **Online Training** - Join one of our weekly WebEx training sessions.
- **Peer Training** - Faculty Advocate connection for qualified adoptions.
- **Technical support** - 24 hours a day, seven days a week, at <http://247pearsoned.custhelp.com>



Introducing
CourseSmart
 The world's largest online marketplace for digital texts and course materials.

A Smarter Way for ...

Instructors

- ▶ **CourseSmart saves time.** Instructors can review and compare textbooks and course materials from multiple publishers at one easy-to-navigate, secure website.
- ▶ **CourseSmart is environmentally sound.** When instructors use CourseSmart, they help reduce the time, cost, and environmental impact of mailing print exam copies.
- ▶ **CourseSmart reduces student costs.** Instructors can offer students a lower-cost alternative to traditional print textbooks.

Students

- ▶ **CourseSmart is convenient.** Students have instant access to exactly the materials their instructor assigns.
- ▶ **CourseSmart offers choice.** With CourseSmart, students have a high-quality alternative to the print textbook.
- ▶ **CourseSmart saves money.** CourseSmart digital solutions can be purchased for up to 50% less than traditional print textbooks.
- ▶ **CourseSmart offers education value.** Students receive the same content offered in the print textbook enhanced by the search, note-taking, and printing tools of a web application.

Institutions & Partners

- ▶ **CourseSmart helps meet market demand.** Partners can use CourseSmart to meet the demand for digital materials in a way that grows share of student purchasers.
- ▶ **CourseSmart reaches new student populations.** Students who may have done without textbooks due to high cost and lack of digital options can now purchase high-quality, affordable educational materials online.
- ▶ **CourseSmart complements traditional brick and mortar offerings.** Partners earn a percentage of sales of materials purchased through CourseSmart.

CourseSmart Is the Smarter Way
 To learn for yourself, visit www.coursesmart.com

This is an access-protected site and you will need a password provided to you by a representative from a publishing partner.