Barbara Gross Davis

Tools *for* Teaching

SECOND EDITION

Tools *for* Teaching

SECOND EDITION

Barbara Gross Davis

JOSSEY-BASS
A Wiley Imprint
www.josseybass.com

The Jossey-Bass Higher and Adult Education Series

Published by Jossey-Bass

A Wiley Imprint

One Montgomery Street, Suite 1200, San Francisco, CA 94104-4594—www.josseybass.com

Library of Congress Cataloging-in-Publication Data

Davis, Barbara Gross.
Tools for teaching/Barbara Gross Davis.—2nd ed.
p. cm.
Includes bibliographical references and index.
ISBN 978-0-7879-6567-9 (pbk.)
1. College teaching—United States—Handbooks, manuals, etc. 2. Classroom management—United States—Handbooks, manuals, etc. 3. Curriculum planning—United States—Handbooks, manuals, etc. I. Title.
LB2331.D37 2009
378.1'25—dc22
2008041906

Printed in the United States of America
FIRST EDITION
PB Printing 10 9 8

CONTENTS

Preface vii

Credits xiv

The Author xv

PART I: GETTING UNDER WAY 1

1 Designing or Revising a Course 3

2 The Comprehensive Course Syllabus 21

3 The First Days of Class 37

4 Classroom Conduct and Decorum 48

PART II: RESPONDING TO A CHANGING STUDENT BODY 55

5 Diversity and Inclusion in the Classroom 57

6 Students with Disabilities 72

7 Reentry and Transfer Students 85

8 Teaching Academically Diverse Students 90

PART III: DISCUSSION STRATEGIES 95

9 Leading a Discussion 97

10 Encouraging Student Participation in Discussion 106

11 Online Discussions 112

12 Asking Questions 118

13 Fielding Students' Questions 127

PART IV: THE LARGE-ENROLLMENT COURSE 133

14 Preparing to Teach the Large-Enrollment Course 135

15 Delivering a Lecture 148

16 Explaining Clearly 157

17 Personalizing the Large-Enrollment Course 162

18 Encouraging Student Participation in the Large-Enrollment Course 168

19 Maintaining Instructional Quality with Limited Resources 174

PART V: ALTERNATIVES AND SUPPLEMENTS TO LECTURES AND DISCUSSION 179

20 Web 2.0 181

21 Learning in Groups 190

22 Informal Group Learning Activities 207

23 Formal Group Learning Activities 214

24 Case Studies 222

25 Simulations: Role Playing, Games, and Virtual Worlds 229

26 Service Learning and Civic Engagement 233

27 Undergraduate Research 244

28 Guest Speakers 251

PART VI: ENHANCING STUDENTS' LEARNING AND MOTIVATION 257

29 Helping Students Learn 259

30 Learning Styles and Preferences 273

31 Motivating Students 278

32 Informally Assessing Students' Learning 290

33 Mobile Learning 298

PART VII: STRENGTHENING STUDENTS' WRITING AND PROBLEM-SOLVING SKILLS 303

34 Helping Students Write Better in All Courses 305

35 Designing Effective Writing Assignments 314

36 Evaluating Students' Written Work 325

37 Homework: Problem Sets 335

PART VIII: TESTING AND GRADING 343

38 Promoting Academic Honesty 345

39 Quizzes, Tests, and Exams 362

40 Allaying Students' Anxieties about Tests 375

41 Multiple-Choice and Matching Tests 390

42 Short-Answer and Essay Tests 401

43 Grading Practices 409

44 Calculating and Assigning Grades 419

PART IX: PRESENTATION TECHNOLOGIES 431

45 Flipcharts 433

46 Chalkboards and Whiteboards 436

47 Interactive Whiteboards 441

48 Overhead Projection 443

49 Slide Shows 447

50 Video Recordings and Clips 450

51 PowerPoint Presentations 453

PART X: EVALUATION TO IMPROVE TEACHING 459

52 Early Feedback to Improve Teaching and Learning 461

53 Video Recordings and Classroom Observations 472

54 The Teaching Portfolio 481

PART XI: TEACHING OUTSIDE THE CLASSROOM 489

55 Holding Office Hours 491

56 E-mail, Text Messages, and Instant Messages 497

57 Academic Advising and Mentoring Undergraduates 504

58 Guiding, Training, Supervising, and Mentoring Graduate Student Instructors 517

PART XII: FINISHING UP 527

59 The Last Days of Class 529

60 Student Rating Forms 534

61 Writing Letters of Recommendation for Students 551

Index 557

PREFACE

Tools for Teaching provides new and experienced faculty in all disciplines with practical, tested strategies for addressing all major aspects of college and university teaching, from planning a course through assigning final grades. Graduate student instructors and teaching assistants will also benefit from the foundational knowledge and research findings described in this book.

This second edition includes twelve new chapters devoted to innovations in classroom technology and current trends on American campuses. In addition, all of the chapters from the first edition have been thoroughly revised to incorporate recent research on college-level teaching and learning.

Certain assumptions about you, the reader, have guided the design and organization of this second edition:

- You teach a course that is primarily face-to-face and use technology for administrative and educational purposes.
- You want to know about specific instructional strategies that faculty members have used successfully and that researchers have found to be effective in developing students' intellectual and cognitive skills.
- You can figure things out for yourself. Once you are presented with the gist of a strategy, you can adapt it to your particular circumstances and needs—or reject it as inappropriate for you and your students.
- You are busy and have little time to read through the burgeoning literature on teaching and learning. You want to be able to quickly locate information and appropriate strategies for improving your teaching and students' learning.

Each chapter contains a brief introduction, a set of general strategies, and concise descriptions of teaching ideas, supported by research, that instructors can adapt and try out. The format lends itself to easy and efficient identification

of major points and to quick reading or browsing. Each chapter can be read independently of the others, and the chapters can be read in any order.

Many of the suggestions can be readily implemented; others require planning or modifications in course design. No one instructor could possibly use even half of the ideas—nor would any instructor want to. *Tools for Teaching* is truly a toolbox from which to select and adapt those ideas that match your teaching style and the needs of your students. Indeed, one of the premises of the book is that there are no pat answers, quick fixes, or sure-fire recipes for excellent teaching and optimal learning, only endless ways to improve.

Sources of *Tools for Teaching*

The information in *Tools* comes from many sources: the research literature in higher education on teaching and learning; books published by scholars, researchers, and faculty development experts on effective educational practices; articles on pedagogy by college and university faculty; conversations with and classroom observations of faculty at the University of California, Berkeley; the Web sites of colleges and universities, especially the resources at teaching.berkeley.edu; and local and national listservs devoted to teaching.

I have made every effort to attribute each entry to a published source or to cite a reference that provides greater detail, although the source cited is not necessarily the originator of the strategy. Some tools, though, are part of general lore or reached me without attribution. If I have misinterpreted any findings or conclusions or if I failed to give appropriate credit, I hope readers will contact me so that I can make corrections in a future edition.

Though *Tools* derives from a substantial body of research and theory, the text focuses on practice. For readers who want to know more about the origin and testing of the strategies, the end-of-chapter reference lists provide starting points. Those seeking discussions of theory and philosophy, essays on good teaching, personal reflections about classroom experiences, examination of the teaching persona, case studies on college teaching, or discipline-specific perspectives on teaching will want to look elsewhere to the many excellent books on these topics. For example, see, among others, Bain's analysis (2004) of the teaching practices of nearly one hundred college and university instructors; Lang's personal week-by-week guide (2008) aimed at those embarking upon their first teaching experience; Palmer's exploration (2007) of a teacher's inner landscape and the importance of emotion and spirit in the educational process; and Kalman (2008) for teaching science and engineering, Showalter (2003) for teaching literature, or Buskist and Davis (2005) for teaching psychology.

Organization of *Tools for Teaching*

Tools is designed to be used as a reference book; it is not meant to be read cover to cover. The twelve parts represent, in a roughly chronological sequence, the principal teaching responsibilities and activities of college instructors. The table of contents, index, and internal cross-references should help you locate the material you need. The following overview may also help you decide where to begin.

Part One, "Getting Under Way," addresses planning: designing a new course or revising an existing one, creating a syllabus, preparing for the first days of class, and managing classroom conduct and decorum.

Part Two, "Responding to a Changing Student Body," offers suggestions for working with students who have disabilities, students from ethnic or cultural backgrounds different from your own, and older students returning to school. The last chapter in this part focuses on classes in which students have widely varying academic skills and abilities.

Part Three, "Discussion Strategies," provides ideas for leading a productive discussion, framing challenging questions, and encouraging student participation, both in class and online.

Part Four, "The Large-Enrollment Course," explores aspects of the lecture method: preparing and delivering effective lectures, engaging students and providing for student participation, and maintaining instructional quality with limited resources.

Part Five, "Alternatives and Supplements to Lectures and Discussion," continues the theme of student participation, looking at the advantages of group work and ways to involve students in role playing, case studies, games, virtual worlds, fieldwork, and undergraduate research. Web-based activities are highlighted in this part.

Part Six, "Enhancing Students' Learning and Motivation," provides research-based approaches to helping students become more confident, independent, and self-motivated learners. Informal ways to assess learning and the use of mobile technologies are also described.

Part Seven, "Strengthening Students' Writing and Problem-Solving Skills," describes how instructors in all departments can help students develop their writing skills—and how to do so without spending enormous amounts of time grading and marking students' papers. This part also offers strategies on designing and grading problem sets.

For many faculty members, testing and grading are among the most difficult aspects of teaching. Part Eight, "Testing and Grading," offers pointers on developing good exams, alleviating students' test anxieties, implementing various grading methods, and promoting academic honesty.

Part Nine, "Presentation Technologies," explores low-tech media (flipcharts, chalkboards), audio and video multimedia, and PowerPoint presentations.

Part Ten, "Evaluation to Improve Teaching," explains how instructors can gather and interpret information that will help them become better teachers. This part includes quick methods for getting immediate feedback from students as well as the use of video recordings, colleague observation, and self-assessment.

Part Eleven, "Teaching Outside the Classroom," offers ideas on office hours, electronic communication with students, advising undergraduates, and working with graduate students as teaching assistants.

Part Twelve, "Finishing Up," covers end-of-term activities: review sessions, student ratings, and letters of recommendation.

Suggestions for Using *Tools for Teaching*

Because each chapter is designed to be read independently, some themes are mentioned in several chapters, an overlap that I hope will not bother the careful reader. Readers will also notice that not all the suggestions are compatible: they represent a variety of strategies from which to choose. As with any new undertaking, it is best to pick one or two activities to start with and add new items to your repertoire over time.

If you are a new instructor, you may want to begin by looking at Parts One, Three, and Four ("Getting Under Way," "Discussion Strategies," and "The Large-Enrollment Course"). You could then read the chapters that seem particularly relevant to your teaching responsibilities and refer to *Tools* during the term as different challenges arise (for example, encouraging students to talk during discussion periods).

If you feel generally comfortable about your teaching but are looking for ways to inject some excitement into your courses, browse through the book and select topics that appeal to you. Or start with Part Three ("Discussion Strategies") and Part Five ("Alternatives and Supplements to Lectures and Discussion"), both of which offer ways to actively engage students.

If you already have a sense of the areas you want to improve, read the chapters that directly relate to those areas.

If you are unsure about your teaching strengths and weaknesses, read Part Ten ("Evaluation to Improve Teaching") for suggestions on how to assess your teaching. Once you have identified areas for improvement, scan the table of contents and the index for the relevant topics.

All instructors can benefit from "Informally Assessing Students' Learning" (in Part Six) and "Early Feedback to Improve Teaching and Learning" (in Part Ten),

which offer suggestions for gauging students' comprehension of course material and for eliciting their opinions of the strengths and weaknesses of your teaching.

A Request

I would be most grateful for your comments on the ideas and perspectives presented in *Tools*. Let me know what you think, and please pass along the good ideas you use in your own courses (email: barbara@BarbaraGrossDavis.com).

Acknowledgments

The second edition of this book could not have been written without the contributions of a great many people, and I am deeply indebted to each of them for their assistance and encouragement.

For sharing freely their ideas about good teaching: I am especially grateful to the faculty of the University of California, Berkeley. Their lively discussions, their generosity in sharing good teaching practices, and their diverse instructional perspectives have contributed both directly and indirectly to this book. A special thanks to those who participate in the Office of Educational Development's listserv, which has been a source of many good ideas about teaching and learning.

For reviewing and commenting on draft material at various stages: I received wise suggestions, insightful comments, and constructive criticism from the following faculty members and administrators at the University of California, Berkeley: Connie Chiba, Steven Chin, Nancy Chu, Aaron S. Cohen, Kevis Goodman, Sarah J. Hawthorne, Bryan Mayberry, Michael H. O'Hare, Oliver O'Reilly, Norma Partridge-Wallace, Eva Rivas, David O. Robinson, Larry Rowe, Susan Schweik, Diane Sigman, Cara Stanley, Philip B. Stark, Kim Steinbacher, Stephen K. Tollefson, Marc Treib, and Linda von Hoene.

For providing a student perspective: Many thanks to Molly McRoberts, Sam McRoberts, Kevin Poindexter, and Sarah Firestone (current and future undergraduates) for their review of selected chapters and their "gr8" suggestions on the use of technology in teaching and learning.

For reviewing and commenting on the entire manuscript: Larry Braskamp, Gary L. Firestone, and Ole Hald provided detailed critiques of the manuscript and were invaluable resources for crucial ideas, critical concepts, and different points of view that helped shape the final text. I am grateful to them for identifying

problems, challenging me to be clear and specific, and making important contributions to both the substance and tone of this book.

For project management, bibliographic, editorial, and research assistance: I would like express my deep appreciation to Jean Barker for her judicious balance of patience and persistence in the face of almost-impossible deadlines; her attentiveness always kept this project moving forward. Her superb organizational skills, proficiency in locating hundreds of resources, and impressive mastery of the intricacies of copy editing have been invaluable. I also thank Mark Rhynsburger and Samuel Case for their help in verifying citations.

For editorial assistance: I am deeply indebted to Amy Einsohn, who worked on both the first and second editions of the book, for her prodigious expertise in condensing and clarifying the text, catching infelicities of language, and providing structural transitions.

For the team at UC Berkeley: My colleagues in my immediate office deserve special accolades for their steadfast support, considerable patience, ongoing encouragement, and complete understanding. Their graciousness and good humor helped make it possible for me to complete this book, and I respect them all: Jean Barker, Debra Fong, Bryan Mayberry, Norma Partridge-Wallace, Julie Rivera, Michele Robinson, Kim Steinbacher, and Steven K. Tollefson. I also thank Christina Maslach and Gibor Basri for their support during the writing of this second edition.

For the team at Jossey-Bass: I would like recognize the expert advice and support of David Brightman, Cathy Mallon, Barbara Armentrout, and Aneesa Davenport. Their editorial and production skills ably guided the book to publication. I am also grateful to Alan Venable for his assistance as development editor in the early stages of this project: he made my work easier.

For reality checks throughout the process: Rita Berro, Karen Gross McRoberts, Molly McRoberts, Sam McRoberts, Gary L. Firestone, Larry Braskamp, Ole Hald, Hilda Kessler, David Sweet, Jean Barker, Norma Partridge-Wallace, Steven K. Tollefson, and Amy Einsohn kept me grounded, motivated, and on track.

For their help on the first edition: I would like to thank the following reviewers and research assistants who helped me with the first edition and whose contributions are intertwined with the concepts presented in this second edition: Natalie Bosworth, Larry Braskamp, Cherry Chaicharn, Frederick C. Crews, Sam Davis, Marian Diamond, W. Russell Ellis, Sally Fairfax, Debra Fong, Ole Hald, Gary Handman, Michael Hardie, Francisco Hernandez, Sheila Humphreys, Helen Johnson, Peter Kerner, Jo Keroes, Matt Kondolf, Leif Krauss, Kristin Luker, Michele Mattingly, Flora McMartin, Margarita Melville, William K. Muir, Rose Nash, John Ory, Kevin Padian, David Palumbo-Liu, McCrae Parker, David Patterson, Matthew Rabin, Vincent Resh, K. V. S. Sastry, Michael Scriven, Mary Ann Shea, Mary Deane Sorcinelli, Daniele Spellman, Richard Sutch, Marilla

Svinicki, Ronald Takaki, Stephen K. Tollefson, Jon Wergin, Joanne Wile, Jana Woodard, and Christi Zmich.

Finally, a private acknowledgment and expression of gratitude to ITG, who has been a steady rock of unconditional support, completely selfless in providing assistance above and beyond the contract. For giving me free passes on my bad days, and for helping this book reach the highest possible standard, I am deeply indebted to him.

References

Bain, K. *What the Best College Teachers Do.* Cambridge, MA: Harvard University Press, 2004.

Buskist, W. and Davis, S. F. (eds.) *Handbook of the Teaching of Psychology.* New York: Wiley-Blackwell, 2005.

Kalman, C. S. *Successful Science and Engineering Teaching: Theoretical and Learning Perspectives.* New York: Springer, 2008.

Lang,

J. M. *On Course: A Week-By-Week Guide to Your First Semester of College Teaching.* Cambridge, MA: Harvard University Press, 2008.

Palmer, P. *The Courage to Teach: Exploring the Inner Landscape of a Teacher's Life.* 10th Anniversary Edition. San Francisco: Jossey-Bass, 2007.

Showalter, E. *Teaching Literature.* London: Blackwell, 2003.

CREDITS

We gratefully acknowledge permission to use the following material:

Chapter 1, pages 9–10: Wankat, P., and Oreovicz, F. "Content Tyranny." *ASEE Prism,* 1998, *8*(2), 15. Used by permission from the American Society for Engineering Education.

Chapter 6, page 82: University of California, Berkeley, Counseling and Psychological Services. Used by permission from Associate Vice Chancellor Steve Lustig, University of California, Berkeley.

Chapter 9, pages 98–99: Tiberius, R. G. *Small Group Teaching: A Trouble-Shooting Guide.* London: Kogan Page, 1999, p. 64. Used by permission.

Chapter 13, page 129: Sprague, J., and Stuart, D. Cengage Advantage Books: *The Speaker's Handbook* (with SpeechBuilderExpress™ and InfoTrac®), 1E. © 2006 Wadsworth, a part of Cengage Learning, Inc. Reproduced by permission. www.cengage.com/permissions

Chapter 26, page 233: University of California at Berkeley Task Force. *Advancing Public Service.* Berkeley: Service Learning Research and Development Center, University of California, 2000. Used by permission from Professor Andrew Furco, formerly of the University of California, Berkeley.

Chapter 40, page 380: Listserv, University of California, Berkeley, Office of Educational Development. Used by permission from Director Stephen K. Tollefson, University of California, Berkeley.

Chapter 43, page 409: Scriven, M. "Evaluation of Students." Unpublished manuscript, University of California, Berkeley, 1974. Used by permission from the author.

Chapter 61, page 555: Swensen, E. V., and Keith-Spiegel, P. *Writing Letters of Recommendation for Students: How to Protect Yourself from Liability.* Washington, D.C.: American Psychological Association, 1991, p. 2. Used by permission from E. V. Swenson.

THE AUTHOR

Barbara Gross Davis, Assistant Vice Provost for Undergraduate Education at the University of California, Berkeley, received a B.A. degree in psychology, an M.A. degree in educational psychology, and a Ph.D. degree, also in educational psychology, all from the University of California, Berkeley. Davis's main areas of interest have been program and curriculum evaluation, instructional improvement, and faculty development—all in higher education. She has conducted workshops and seminars on topics related to teaching, learning, and evaluation, and she has written about faculty evaluation, assessment, and teaching improvement.

To my mother, Rita Berro, my first and best teacher

PART I

Getting Under Way

1. Designing or Revising a Course
2. The Comprehensive Course Syllabus
3. The First Days of Class
4. Classroom Conduct and Decorum

1

Designing or Revising a Course

In designing or revising a course, faculty must consider what material to teach, how best to teach it, and how to ensure that students are learning what is being taught. Many instructors, hoping to impart to students everything they know about a subject, attempt to include far too much material. Indeed, one of the most difficult steps in planning a course is deciding which topics must be excluded if the whole is to be manageable. The following suggestions are designed to help you make decisions about the content of your course, the structure and sequence of activities and assignments, the identification of learning outcomes, and the selection of instructional resources.

General Strategies

Let your decisions be guided by what you want your students to accomplish. Instead of thinking about the topics you want to teach, focus on learning outcomes: What do you want your students to be able to do after they have studied the material and completed their assignments? What knowledge, skills, attitudes, and "habits of mind" do you want your students to acquire during the semester? (Sources: Diamond, 1998; Fry et al., 2003; Ramsden, 2003; Suskie, 2004)

Apply principles that will enhance students' learning and intellectual development. The most important of these principles are discussed in Chapter 29, "Helping Students Learn." For example, you will want to think about how to provide your students with opportunities for active learning and for peer interaction, how to organize and communicate the material, what constitutes a reasonable workload, and how you and your students will monitor and assess their progress. (Source: Donnelly and Fitzmaurice, 2005)

Design or revise your course with principles of universal design in mind. Universal design is based on the premise that barrier-free, inclusive design benefits

everyone—those with and without disabilities—and thereby eliminates or reduces the need for assistance and accommodation (see Chapter 6, "Students with Disabilities"). In college classes, instructors can

- use a variety of instructional methods
- offer students multiple ways to demonstrate mastery
- use technology to increase accessibility
- provide options for participation and presentations
- invite students to make their needs known

Aim for alignment of course elements. *Alignment* means that learning outcomes, instructional activities, and assessments of student learning are consistent and reinforce each other. Research shows that learning is improved when there is alignment among what instructors intend to teach, what they actually teach, and what they test. (Sources: Whetten, 2007; Wulff, 2005)

Preliminary Information Gathering

When preparing to teach a course for the first time, talk with faculty who have taught it previously. Ask your colleagues for their syllabus, course Web pages, instructional resources, list of assignments and papers, and old exams. Find out about the typical problems their students had with the material and any other difficulties the instructors encountered. Student evaluations of earlier offerings will also help you identify strengths and weaknesses of previous classes. If webcasts or podcasts of the course are available, view them as well.

When preparing a brand new course, review textbooks on the topic and materials or webcasts from similar courses at other universities. Current textbooks will give you a sense of the main themes, topics, and issues your course might address. Reviewing syllabi and webcasts or podcasts will let you see how other instructors approach the topics. Syllabi for introductory courses are often available from professional associations; some universities post syllabi online (see, for example, the MIT OpenCourseWare Web site).

Think about how your course fits into your department's curriculum and sequences. Look at the syllabi for prerequisite courses and the courses for which your course serves as a prerequisite. The former will give you a sense of what your students will already know, and the latter will help you identify the knowledge and skills that your course is expected to address.

When revising a course you have taught, assemble all your old materials. You will want to look at your syllabus, textbooks and readings, handouts, exams, notes for each class session, and other instructional resources. Review the students' end-of-semester evaluations to remind yourself of the course's strengths and weaknesses. Examine your materials in light of students' comments, new developments in the field, and your own changing interests.

Consider the characteristics of your students. As you plan your course, think about your prospective students: What range of knowledge, skills, and attitudes might they bring to the course? Will they be new to the field, potential majors, majors, or nonmajors? What courses have they already completed? What preconceptions and misperceptions might they have? Will all or most of your students be just out of high school, or older and more mature? Will some be part-time students who have work or family responsibilities? Will they be living on campus or will they commute?

Identify constraints on the course. As you begin to design the course, ask yourself, How many hours are available for instruction? How many students will be enrolled? Will you have lab assistants, graduate student instructors, or readers? What sorts of technology will be available in the classroom? Will there be opportunities for fieldwork or internships? What barriers or obstacles might detract from your students' learning?

Deciding What You Want to Accomplish

Think beyond this semester. Imagine yourself overhearing a group of graduating seniors who have taken your course and are discussing why it was among the most valuable courses they had ever taken. What would they be saying about your course? Or imagine that several of your students will become local or national power brokers, or that half of them will drop out of school before graduation. What would you like the legacy of your course to be for these students? What will distinguish students who have taken this course from those who have not? (Sources: Bergquist and Phillips, 1977; Fink, 2003; Wiggins and McTighe, 2005)

Use taxonomies to help identify a range of learning outcomes. Bloom's classic *Taxonomy of Educational Objectives* (1956) outlines six levels of cognitive processing: Knowledge, Comprehension, Application, Analysis, Synthesis, and Evaluation. Although Bloom's taxonomy oversimplifies how learning occurs, and research

has not supported its hierarchical structure, it provides a useful starting point for defining learning outcomes that go beyond the memorization of facts. Applying new research on learning and cognitive development to Bloom's taxonomy, Anderson and Krathwohl (2001) offer a matrix that matches four types of knowledge (Factual, Conceptual, Procedural, and Metacognitive) against each of six cognitive processes (Remember, Understand, Apply, Analyze, Evaluate, and Create). In this revised taxonomy, learning progresses from the remembering of factual knowledge to the creation of new knowledge and the ability to reflect on one's own learning.

Fink (2003) developed a taxonomy that takes into account types of learning not readily apparent in the Bloom taxonomy or revised taxonomy: leadership, interpersonal skills, ethics, tolerance, and the ability to change. He proposes six nonhierarchical categories (Foundational Knowledge, Application, Integration, Human Dimension, Caring, Learning How to Learn). Here's an example of a learning outcome from the Human Dimension: "You will be able to inform and educate others about the role of microbiology in personal and public life; for example, by educating your roommate about proper ways of cooking a hamburger."

Erickson, Peters, and Strommer (2006) have developed a framework that uses everyday language in four categories: Knowing (memory), Understanding (ability to recognize), Thinking (applying what one has learned), and Learning How to Learn. Here's an example of an outcome from Understanding: "You will be able to identify which of a list of chemical equations conform to the Law of Conservation of Mass."

Another framework (Fry et al., 2003) takes into account research on deep and surface approaches to learning (See Chapter 29, "Helping Students Learn"). The first three levels are surface approaches: Increase in Knowledge, Memorizing, and Acquisition of Procedures. The last two are deep approaches: Abstraction of Meaning and Understanding Reality. Here's an example of an outcome from Abstraction of Meaning: "You will be able to provide a causal analysis of the seminal historical events that have shaped modern British society." Still another taxonomy (called SOLO and developed by Biggs, 2003) also has five levels: Prestructural, Unistructural, Multistructural, Relational, and Extended Abstract. An example of a learning outcome from Relational is "When shown a graph of severity of asthma attacks by time of a day, you will be able to advise a patient how to cope with diurnal variation in symptoms."

Marzano's taxonomy (2001) articulates six levels of mental processing: Retrieval, Comprehension, Analysis, Knowledge Utilization, Metacognition, and Self-System Thinking. Here's an example of a learning outcome from

Metacognition: "You will be able to monitor the extent to which you are effectively carrying out the proper experiments needed to isolate a gene."

Some two dozen frameworks or taxonomies have been developed to define domains of learning, development, and cognition. For descriptions of some of these taxonomies, see Anderson and Krathwohl (2001).

Draft a list of learning outcomes. What do you expect your students to know, do, demonstrate, or produce as a result of taking the course? Writing down these learning outcomes will help you (1) clarify what you want your students to accomplish; (2) determine what will count as evidence of student achievement; and (3) select appropriate teaching methods, materials, and assignments. At the start of the semester, you can refer to these learning outcomes when introducing the course to your students, and your students can use your list to monitor their progress. (Source: Wiggins and McTighe, 2005)

Identify both content outcomes and content-neutral outcomes. Content outcomes relate to students' grasp of the subject matter: "At the end of this course, you will be able to summarize the key forces affecting the rise of China as an economic power." Content-neutral outcomes relate to cognitive skills, interpersonal skills, and other outcomes independent of a student's mastery of course content: "At the end of this course, you will have learned to work collaboratively with peers." For each outcome, think about what constitutes acceptable performance and how your students will demonstrate that they have achieved the outcome. (Source: Fuhrmann and Grasha, 1983)

When writing learning outcomes, use clear language and everyday words. Express your learning outcomes in the second person ("you"), rather than the third person ("each student" or "the students"), and in the future tense: "When shown an electrocardiogram, you will be able to identify the duration, amplitude, and morphology of the QRS complex."

Fry, Ketteridge, and Marshall (2003) and Race (2007) offer other useful tips:

- Describe the learning that will result from an activity. Instead of "You will read one journal article on trade flows," write "You will be able to apply the analysis presented in a journal article on trade flows, and predict the effects that higher commodity prices will have on the U.S. trade deficit."
- Favor precise terms (*critique, define, distinguish among, argue, identify, solve, predict*) over vague ones (*understand, know, appreciate, become familiar with*).
- Drop trivial items from your list; help students focus on the most important learning outcomes.

- Think ahead to assessment. As you draft each learning outcome, ask yourself how you will measure how well a student has achieved the outcome.
- Recognize that some educational aspirations cannot be evaluated with certainty: aesthetic appreciation or creativity, for example (Toohey, 1999).

Reduce your preliminary list of learning outcomes to a realistic set. Take into consideration the different abilities, interests, and expectations of your students and the amount of time available for class instruction. How many outcomes can your students reasonably achieve during your course? (Source: Lowman, 1995)

Anticipate students' questions about learning outcomes. Students may want to know why a particular learning outcome is being addressed or the importance of an outcome. When your students understand the short-term and long-term benefits of acquiring a particular skill or competency, they are more likely to try to achieve it. To reinforce the importance of learning outcomes, mention them throughout the course. (Source: Race, 2007)

Defining and Limiting Course Content

Review your preliminary list of topics and toss the excess baggage. Designing a course is somewhat like packing for a long trip. First, list everything that you feel might be important for students to know, just as you might pull out armloads of clothes and personal items for a trip. Then severely pare down the topics you have listed, just as you would limit yourself to whatever will fit in one or two suitcases. Research shows that including too much detail or too many topics interferes with students' efforts to learn the material. (Source: Bransford et al., 2000)

Distinguish between essential and optional material. Divide the course concepts or topics into three groups: basic material that should be mastered by every student, recommended material that should be mastered by every student who is seeking a good knowledge of the subject, and optional material that should be mastered by students with special interests and aptitudes. Course sessions and exams should focus on the basic topics. Recommended and optional topics, labeled as such for students, can be included in class sessions, supplementary materials and resources, and readings.

Draw a concept map. To help you determine which topics are most important, you can create a concept map, a chart that captures the central, major, and minor

concepts and the relationships among them. To draw a concept map, follow these steps:

- Write down all the ideas that seem important in the course.
- Reduce your list by circling the ideas that are most important.
- Write each of the circled concepts on a sticky note.
- Sort the sticky notes into meaningful clusters or groups.
- Name each cluster, and write each name on a sticky note.
- Arrange the cluster names (key concepts) in a way that is meaningful to you.

(Sources: Amundsen et al., 2004; Donald, 2002)

Emphasize the core concepts. For example, in engineering, as one professor points out, there are thousands of formulas, but all of them are variations on a small set of basic ideas or theories. In a single course, students might encounter a thousand equations. Rote memorization is futile because no one can remember that many equations. Instead, the instructor repeatedly emphasizes the fundamentals by showing students how the thousand equations are embedded in a dozen basic ones.

Focus on the "big idea." A big idea is a concept, theme, theory, issue, underlying assumption, or critical principle that gives meaning to an array of discrete facts, topics, inquiries, or issues. In different fields, examples of big ideas are the challenge of defining justice, the distinction between the letter and the spirit of the law, adaptation, and the need for communicators to focus on audience and purpose. (Source: Wiggins and McTighe, 2005)

Stress the classic issues, or the most enduring values or truths. Often the most interesting issues and themes for undergraduates are those that first attracted you to the discipline. You might also focus on the most critical skills or ideas, and drop the rest. Or give special attention to important ideas that are usually hard for students to understand. (Source: McManus, 2005)

Limit course content to five types of information. When reducing your preliminary list of topics, limit yourself to

1. key points and general themes
2. especially hard-to-understand material
3. important material that is not addressed in the readings or elsewhere

4. examples and illustrations
5. material of high interest to students

(Source: Wankat and Oreovicz, 1998)

Include multiple perspectives and scholarship. A unit on the impact of World War II on the American economy, for example, could address the views and experiences of different ethnic and income groups. See Chapter 5, "Diversity and Inclusion in the Classroom."

Select a manageable number of course topics. Experienced instructional designers recommend four to seven topics or issues for a semester-long introductory class. For example, in an introductory biology class, the principal topics might be (1) molecules, cells, and tissues, (2) cellular communication and hormone action, (3) human reproduction, (4) stem cells and human development, (5) the physiology of organ systems, and (6) organ dysfunction and disease.

Structuring the Course

Devise a logical arrangement for the course content. Material can be arranged chronologically, by topic or category, from concrete to abstract or vice versa, from theory to application or vice versa, or by increasing level of skill or complexity. Here are some other organizing principles (Bergquist and Phillips, 1977, pp. 146–149):

Micro/macro: Begin by describing a large complex phenomenon (macro perspective) or by offering a detailed analysis of one aspect of the phenomenon (micro perspective). Establish a broad general base of knowledge and information (macro), or focus on a specific event or concern (micro).

Distal/proximal: Begin by presenting an immediate, urgent problem (proximal perspective) or by describing a phenomenon's origins, heritage, or context (distal perspective). Begin by discussing the relevance of a topic (proximal) or by presenting a historical or theoretical perspective (distal).

Phenomenon/structure: Emphasize description and analysis of unique and significant events, people, or ideas (phenomenon) or emphasize description and analysis of theories, themes, and universal applications (structure).

Stark (2000) and Toohey (1999) offer additional patterns for ordering topics:

- how ideas have evolved chronologically
- how relationships occur in the real world
- how students will use the information in social, personal, or career settings
- how major concepts and relationships are organized in the discipline
- how students develop competencies (from prerequisite to novice to expert skill sets)
- how knowledge has been created in the field

Keep in mind that a structure that seems logical and clear to you (an expert) may not be the best way for a student (a novice) to learn the material (Ramsden, 2003). From a student's point of view, it may be preferable to begin the course with a topic that will generate confidence and interest in the material. Students tend to be more motivated to work hard when they succeed at the beginning of the term and when they can relate the new material to something they already know.

Create a schedule. List all class meetings, accounting for university holidays, major religious holidays, breaks, and any college events that may preempt classes. Write in tentative topics and dates for exams. Keep in mind the rhythm of the term, and leave open at least part of the class before each exam to allow for catch-up or review. Allow extra time for complex or difficult topics. Schedule time during the middle of the semester for quick student evaluations of the course (see Chapter 52, "Early Feedback to Improve Teaching and Learning"). Also give special consideration to the first days of class (see Chapter 3, "The First Days of Class"), the meetings right before exams, and the last week of class (see Chapter 59, "The Last Days of Class"). You will want to include this schedule in your course syllabus (see Chapter 2, "The Comprehensive Course Syllabus").

Select instructional methods for each class meeting. Instead of asking, "What will I do at each session?" focus on what you want your students to be doing, thinking, or feeling. Look at your learning outcomes and identify suitable classroom activities. (Activities discussed in different sections of this book include lectures, small-group discussions, independent work, simulations, debates, case studies, role-playing, and demonstrations.) For each topic, decide how you will introduce the material, present new concepts, have students apply what they have learned, and assess whether students can put into practice what they have learned. (Source: Bligh, 2000)

Design in-class and homework assignments. See Chapter 35, "Designing Effective Writing Assignments"; Chapter 37, "Homework: Problem Sets"; Chapter 21, "Learning in Groups"; and other chapters.

Selecting Textbooks, Readings, and Course Materials

Choose textbooks and reading assignments that reflect your learning outcomes. McKeachie and Svinicki (2006) recommend that instructors select textbooks that generally match their own approach to the material. Students can be annoyed or confused if you repeatedly disagree with the text, and some will wonder why they were required to buy and read such an unsatisfactory book. To expose students to a range of perspectives, you can assign articles and shorter texts that espouse different points of view. And to help students understand that the textbook is not a final authority on a topic, you can pose occasional counterarguments and other interpretations. (Source: National Research Council, 1997)

Avoid requiring students to purchase a textbook you have authored. Although it may arguably be the best resource available, the fact that an instructor stands to benefit financially can be alienating to students, especially if the textbook is expensive, and can be seen as a real or perceived conflict of interest. If you decide to require students to purchase your textbook, consider making a contribution of the royalties to your financial aid office or other campus program or service.

Consider a range of criteria in selecting textbooks. If several textbooks are appropriate to your course, use the following criteria to select among them (adapted from Dake, 2007; Forsyth, 2003; Lowman, 1995; National Research Council, 1997; Robinson, 1994):

- content: accuracy, currency, coherence, and clarity
- scope and sequence of topics (organization of material)
- level of difficulty and interest for students (challenging but not too difficult)
- conceptual orientation and approach to the subject matter
- availability of alternative media formats for students with disabilities
- quality of writing
- pedagogical design (clear headings and subheadings, chapter previews and summaries, review questions, glossaries, and so on)
- cost (paperback instead of hardback; a less expensive book if it is of comparable quality)