



Second Edition

The Art & Craft of College Teaching

Robert Rotenberg

A blue, rounded rectangular graphic with a small tab at the bottom, resembling a bookplate or a piece of paper pinned to a wall. It contains the text 'A Guide for New Professors and Graduate Students'.

A Guide for
New Professors
and Graduate Students

The Art & Craft of College Teaching



**A Guide for New Professors
& Graduate Students**



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**A Guide for New Professors
& Graduate Students**

Second Edition

Robert Rotenberg

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Preface

Something new happens every time I go into the classroom. It does not matter what course. It does not matter how many students greet me. If I did not experience this novelty, I would have chosen a different profession. The classroom renews me as a scholar, as a university citizen, and as a colleague. When I first started teaching, I could not believe that they paid me to have so much fun. Now, I am grateful that my school values my contribution to our students' lives with the salary they pay me. I try to share my enthusiasm with my colleagues, especially younger colleagues who discover the secrets of the classroom for the first time.

My university has experienced extraordinary growth in the last decade. This has added dozens of new faculty to our college and doubled the size of my department. As chair, I was the primary mentor for new faculty. I would find myself saying the same things to each new colleague. I decided to write it down. That became the germ of this book. I want to share this approach to college teaching beyond my own institution.

Teaching satisfies many of my needs. One of them is the need to live in a community of citizens who can reason clearly and accurately about the issues we all face. I teach because teaching creates that community one citizen at a time. If I can persuade you to stimulate your students to become the best reasoners they can be, our communities become better places for all of us to live.

Currently you can find a dozen books on college teaching in print and another dozen through libraries. In the first years of teaching, no one has time to read them all. I have read them all and the supporting research literature as well. I have taken the best they have to offer and combined it with my own experience as a teacher, as a mentor, as an administrator, and as a social scientist. The result, I hope, will guide you to a better teaching practice.

Acknowledgments

My model teachers were men and women who established a relationship with me and my fellow students as learners. They put our needs first. I have known such teachers since grade school. I don't even remember all their names. I do remember their classrooms. I remember thinking that being a teacher and working in such a place must be the most satisfying work experience. In high school, the feeling changed. I wanted out. I wanted to skip this stage. With few exceptions, the classrooms were no longer places that had a place for me. Getting into college entailed higher stakes. The teachers kept the gates. They designed their classrooms with opportunities to fail, rather than opportunities to succeed. I looked to college as the chance to return to my own Golden Age of Learning. When I finally arrived, I found the classrooms not that different from high school. Still, the classrooms I sought did exist. I found them; teachers committed to teaching the art of learning. They were men and women of infinite patience. With all the distractions going on in my life at the time, they had to be.

The idea for this book came from my experiences as a fellow at the Internationales Forschungszentrum Kulturwissenschaft in Vienna, Austria, in Fall, 2001. Working with young Ph.D.'s from different European schools made me ever more aware that we continue developing critical thinking skills after graduate school. I am grateful to Gotthart Wunberg and Lutz Musner for creating a superb environment for interaction between senior and junior scholars in cultural studies. I owe a special thanks to the other two senior fellows, Scott Spector and Peter Jelavich, for constructive help in the earliest stages of this project.

This book owes a great deal to my colleagues at DePaul. They helped me sustain a conversation on teaching for over thirty years. It began with an interdisciplinary reading group I joined when I started. With Larry Bennett, James Block, Joanne Devine, Michael Mezey, Charles Strain, Jacqueline Taylor, and Harry Wray, we lowered the disciplinary walls that graduate education had taught us to defend, discovering that we really had a common conversation. While talking about teaching was not our first priority, our classroom experiences found their way in.

The interdisciplinary classroom experiences we developed later emerged from this conversation.

I conducted my first teaching seminar for faculty in 1996. I could not have done so without the support of Jean Knoll of DePaul's School for New Learning and Phyllis Waldron of Morton College. They taught me approaches to the classroom that I might never have encountered otherwise. Jean also introduced me to problem-based learning in 1988. She taught me to teach students to do the same things I did when I set about to learn something new. She changed my teaching radically.

More recently, Charles Suchar, Caryn Chaden, David Jolliffe, Gerry Mulderig, Larry Mayo, Jeffery Carlson, Midge Wilson, Lucy Rinehart, Randell Honold, Sandra Jackson, Beth Kelly, Patrick Callahan, Jody Cressman, and Nancy Hill invigorate my teaching with every conversation we have. Visiting scholars, especially Susan Wolcott and Peter Ewell, have refreshed the ideas from time to time. I am especially grateful to Susan Wolcott for permission to use extensive summaries of her work with the late Cindy Lynch.

Finally, this book could not have been written without the conversations I have had with Michael McIntyre, Heidi Nast, Gil Gott, Sharon Nagy, Jane Baxter-Gordon, Ginger Hofman, Mark Hauser, Robert Adams Anna Agbe-Davies and John Mazzeo during their first five years of teaching. They taught me how to talk about teaching through their questions. They have encouraged me to become a better learner. David Jolliffe, Charles Suchar, Nancy Hill and Beth Kelly read the manuscript at various stages. Each contributed something valuable to its final shape through their comments.

Sonja Rotenberg took an active interest in this project from the beginning. Together we formed a publishing venture to make sure that the book came out in the form we wanted. At the same time, my daughter Ariela was experiencing the extraordinary and sometimes the less than extraordinary teaching of a selective public high school and a selective liberal arts college. She found that selectivity in admissions does not guarantee effective teaching. Without the help of Sonja and Ariela, this book may never have been finished.

I dedicate this book to both of them.

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PART
1

Teaching as an Art and Teaching as a Craft

If I have imagined my audience accurately, most of you will spend your careers in institutions that value research above teaching. Personnel committees say that they evaluate our performance according to our accomplishments in teaching, research, and service. In annual reviews and evaluations leading to tenure and promotion, we often treat these as isolated activities, with research the only one that “really counts.” The idea that teaching and research would be evaluated for the influence they have on each other is unfathomable in most departments. Some faculty might even consider it offensive. Service and research might influence each other, especially as service is usually defined. That is, as work on university committees. I have been fortunate to work in a college that is among the increasing number nationally that evaluate teaching, research, and service holistically, seeking the connections between them as a measure of a professor’s effectiveness. I admit that this experience is unusual. Even if your department, college, or university works from the older, more common tradition, you can profit as a researcher, a teacher, and a community member by increasingly integrating your efforts over time. Doing so provides greater job satisfaction, a coherent research agenda, a more enticing, burnout-free teaching career, and an effective service orientation.

The best way to learn something is to teach it. The most neglected aspect of teaching is the general improvement in the teacher’s own reasoning skills. When we teach our students to consistently challenge their thinking habits, developing problem-solving patterns and processes that are ever more effective, we cannot help but reflect on our own habits. As

we instruct our students in ferreting out contradictions and fallacies in the work of others, we see how these might creep into our own arguments. As we attempt to model the traits of critical thinking in the classroom, these carry over into our collaborations with graduate students, colleagues, and research partners. In short, teaching with a methodology makes us better methodologists.

One short book is not going to resolve all the issues surrounding university teaching. Urging young professors to think of teaching as part of the realm of scholarship is a first step. I want to convince you, as I have been convinced, that the classroom inspires research. I hope this book will encourage colleagues at all stages of their career to discuss our classroom experience in an informed manner, accurately distinguishing between undergraduate and graduate teaching.

We now know something about how college students learn and what effective teaching looks like. Other than the legitimate complaint about the amount of time it takes to read the research and pull the information together, there is no excuse for college teachers not knowing how to be good at what they do. My aim here is to do a lot of that time-consuming assembling for the new professor or those wanting to become instructors. The perspective I support in forging an effective classroom practice grew out of my reading of this research, especially the idea that intellectual development continues throughout adulthood at different rates for different people, depending on how they are stimulated.

Our students are individuals, each with a unique set of strengths and weaknesses. For some those strengths are prodigious. There are entering students who have the reasoning skills of graduate students. There are graduate students who still reason like the typical entering college student. The differences for all these students between their experiences in high school, in college and in graduate school lie in the expectations that we, their teachers, set for them.

When students come to college, we expect them to struggle with ambiguities of inference and interpretation. At the same time, we expect them to be open to the difference between evidence and opinion in an argument. When students come to graduate school, we expect them to construct well-supported arguments that prioritize among alternative perspectives according to contemporary disciplinary prerogatives and paradigms.

Our few selective colleges and graduate schools admit students with similar levels of preparation. One of my colleagues calls this making a silk purse out of silk. However, the vast majority of university teachers work in schools where the level of preparation for both undergraduate and graduate students is mixed. Here, then, is the compelling intellectual puzzle of post-secondary teaching: how do we deal with the variety of preparations and rates of development in our students while moving all of them toward greater scholarly success?

When we view teaching as a form of scholarship, every classroom presents itself as a new and equal challenge. Each course in the curriculum finds an equal footing with every other course. Faculty judge their worth as teachers not by the proportion of higher-level courses their colleagues entrust to them but by the transformational possibilities of all their classrooms.

The following chapters cull the best ideas from the existing literature on college teaching and offer insights from my own experience. I tell my students that a book is a tool for thinking. I offer this book as a tool to help you think about teaching. It is not merely a how-to manual. It is a program for developing a successful career as a professor.

I expect that this book will stir debate about teaching effectiveness, the assessment of curriculum design, and the mentoring of new professors. At least I hope that the perspective I offer here will breathe new air into these perennial discussions. I do not claim to have all the answers. I have not invented the ultimate evaluation form. Nor have I found the magic words that will help struggling assistant professors find their inner teacher.

Some of the ideas I present here may annoy experienced colleagues as too prescriptive: “That’s not how I do it, and I’ve won teaching awards.” I do not intend this work to be exhaustive or encyclopedic. I am sure that I have missed some important questions, research findings, and techniques. I am also certain that readers will discover inadvertent mistakes. I accept responsibility for all these errors, omissions, and oversights and commit myself to correcting them in future editions. I want to thank ahead of time those colleagues who read this book in detail and send me their thoughts on how it can be more useful to them.

The Learning Curve of the College Teacher

Researchers on teaching agree that instructors see their classrooms in one of two ways: as teacher focused or as student focused (Biggs 1999, 57-75; Martin and Balla 1991, 298-304; Prosser and Trigwell 1998; Samuelowicz and Bain 1992, 93-112). Teacher-focused classrooms are ones in which knowledge is transmitted by an expert teacher to a novice student. If the teacher communicates clearly and effectively, the student moves closer to becoming an expert. At the lower levels of the curriculum, this knowledge is primarily definitions of key concepts, elementary algorithms for transforming data, incidents in a historical narrative, and similar lists within categories. At the higher levels of the curriculum, the knowledge takes the form of important concepts necessary for understanding the more subtle research issues in the discipline. The intended outcomes for the student include the ability to reproduce the information and analytical processes.

Student-focused classrooms permanently transform the student's view of the world in a way that leads the student to continuously learn. Student-centered classrooms emphasize independent learning that will shape the student's attitudes and accomplishments throughout life, including their increasing expertise in a discipline. What the student does in the classroom affects this transformation far more directly than what the teacher does in the classroom. Faculty do not set out to specifically create one or the other of these transformations. Rather, the students' experience results from challenges that instructors create for them.

The outcomes of teaching vary. They depend on variables that instructors can never control, as well as ones they can sometimes control. The range of student abilities and the constraints of the curriculum are beyond the instructor's control. Classroom design and assessment are within the instructor's control. Instructors make these choices differently, depending on their experience and reflectiveness. According to Biggs (1999, 57-75), each of these choices determines whether the classroom will end up being student focused or teacher focused.

Beginning instructors realize that there are some students who respond to their efforts and others who resist. They believe that it is the students' responsibility to bring the desire to learn to the class. Teachers in this predicament reason that the best that one can do is to hold the line on standards and allow the variation in the students to emerge as a grade distribution. Biggs calls this practice one that focuses on "what the student is." When students perform poorly, as some of them will in such situations, it is because something in them is deficient: skills, motivation, ability, attitude, or cultural background (Samuelowicz 1987, 121-34).

More experienced faculty will grow tired of this situation. They begin to examine how they might be complicit in their students' achievements. Biggs calls this practice one that focuses on "what the teacher does." They seek out more classroom management skills, collect books on teaching, and cultivate techniques to increase student engagement and motivation to learn. While good management is essential for setting the stage for learning, it does not guarantee student learning. When students continue to perform poorly, as they will even in the most carefully managed of classrooms, it is because something in the teacher is deficient. Teaching becomes a collection of competencies. The more of them that you control, the better teacher you are. This view of teaching often underlies the administrative evaluation of the teaching experience. Departments and colleges make personnel decisions based on claims of teacher effectiveness that essentially measure classroom management skills, rather than student learning.

The most effective teachers realize that they can embody all the possible competencies and some portion of students still will not learn. They begin to ask themselves, "What does it actually mean when students understand a concept? How does it change their thinking or behavior in some demonstrable way? What activities are necessary for this understanding to take place for the student?" These questions begin to shift the focus away from what teachers do and toward what students are doing:

If students are to learn desired outcomes in a reasonably effective manner, then the teacher's fundamental task is to get students to reengage in learning activities that are likely to result in their achieving those outcomes.... It is helpful to remember that what the student does is actually more important in determining what is learned than what the teacher does. (Shuell 1986, 411-36)

Many faculty will say that they embrace the student-focused classroom, but this is much harder to put into practice than most are willing admit. In general, student-focused classrooms require us to develop three specific areas of the class that are not part of traditional teaching: specific statements about desired outcomes that can be learned in a reasonably effective manner, a set of assessment tasks keyed to these outcomes, and a set of learning (as opposed to teaching) activities where the outcomes have a reasonable chance of being achieved.

If one can skip a stage, it is not really a stage. The same holds for stages in developing teaching. I would not encourage colleagues who have never taught before to jump directly to the student-centered classroom unless that was the basis of the education they received, and they understand its principles. New instructors cannot help but begin with trying to understand the variety of students they meet. This stage can help you learn to articulate the basic principles of your discipline in ways that communicate to the broadest audience. This stage truly acquaints you with the students in your college. You learn how better to manage classrooms. This stage unfolds over at least two years of full-time teaching.

Once you have come to grips with the variation in learners, you begin to search for techniques. There is so much good information out there about classroom design and management that it is almost a malpractice not to seek it out. The administration of your school will expect you to develop ever-greater competencies. Several years of trying out different techniques provides a basis on which student-focused teaching can be built.

The instructor's embrace of student-centered classrooms is not an inevitable one. We all know colleagues who have taught their entire careers in stage 1 and can point to hundreds of students who went on to be successful learners. Stage 2 teachers are the ones who tend to win awards. Their classrooms provide the kind of novelty that holds student interest and generates outstanding evaluations. Their students see them as showing greater concern. These colleagues, too, can point to hundreds of successful learners emerging from their classrooms. Many instructors at this stage hold back from developing further. They do not see their teaching as broken, so why fix it. Stage 3 teachers, therefore, are quite rare at the undergraduate level. Such teaching is more often directed at advanced graduate students. The closer they get to becoming experts, the more they will learn independently. Bringing that attitude into undergraduate practice sets the advanced instructor apart from her peers.

Every school has some faculty who practice these techniques among undergraduates, but it is not a mainstream practice. Each can be effective in meeting some of the desired outcomes. The university will always have classrooms designed by instructors at all three stages of instructor development. I have no illusions that at some point in the future all instructors will embrace student-centered learning the first day they step into the classroom and follow that practice throughout their careers. That being the case, in the chapters that follow I have tried to provide support for faculty at all three stages.

CHAPTER

2

Chapter 2: Plan of the Book

Balancing the expansion the knowledge base of the students with the development of their critical reasoning skills challenges all postsecondary teachers. These two goals cannot be accomplished as addenda to each other. Students do not learn new habits of reasoning by committing lists of items to memory. They do not acquire the knowledge base by drilling on problem sets. The knowledge base must be taught using techniques that are effective for teaching information, and the skill set must be developed using techniques that challenge reasoning. Each moment in the curriculum has its golden proportion of knowledge gained and skills practiced.

Every instructor should know the qualities that students bring to the classroom. There can be at least one generation and sometimes as many as four generations that separate the students from the teacher. You need to understand what these generational experiences are and how they affect performance in the classroom. The current students, born between 1984 and 2000, seem to have something in common with the baby boom and post-boom generations who fill the professoriate. Yet, the differences remain quite large (Howe and Strauss 2000).

More importantly, the vast majority of our students intend to spend their lives outside the university. They have different goals and values than those who chose to work as professors. The professor has always

set the standards for classroom performance. Given these generational differences, we must adapt the way we communicate these standards. The failure to do so risks exposing us to charges of irrelevance and ivory-tower-ism.

Our teaching is embedded in a university curriculum. This curriculum makes demands on individual courses that professors cannot ignore. New professors experienced a curriculum as students. When they enter a department, they take on responsibility for holding up their end of a conversation that began before they arrived—namely, what combination of experiences best communicates the important values and accomplishments of the discipline to the students. Having an overview of the curriculum is important for understanding how to implement many of the course design features offered in this book. In the curriculum, the balance changes according to the role the course plays: topical courses are knowledge base heavy; methods sequences emphasize skill sets. How, then, does the department see the courses that lie between?

Course design begins with constructing a syllabus. I understand the syllabus three ways: as a virtual and an actual document of the instructor's complete plan for a course, and as the proffer of a contract with students that outlines everyone's rights and responsibilities in the class. A list of readings, discussion topics, and due dates for assignments and exams is not a syllabus. Add a bibliography and a set of paragraphs about grading and attendance policies, and you still do not have a syllabus, although at least you now have something that begins to define the classroom. The full syllabus is the mechanism through which the entire organization of the course is developed. It is both a working document, in the sense that it evolves with each course, and a scholarly document of the complete teaching effort. Well-constructed syllabi are like journal articles or technical reports. They are complete enough for another teacher to read them and know exactly how the classroom experience was designed, how student learning was assessed, and how the achievement of the goals of the course was evaluated. I will offer a step-by-step plan for developing syllabi.

With the beginning of the actual term, the first order of business is explaining the syllabus. The second is assessment. I have colleagues who see assessment as an unwelcome and silly imposition by an administration cowed by an accreditation agency. They find it busywork that contributes nothing to effective teaching. I begin with it because it is a way of establishing an ongoing conversation with students about classroom learning. There

is no more effective aid to teaching than knowing who is sitting in front of you and what their actual knowledge and skill levels are at the beginning of the term. My discussion of assessment here is classroom based and modest in its aims. I see assessment as a stance that you take toward the students, an openness to their actual experience that goes beyond impressions and anecdotes to more solid information sources.

College teachers should be able to design any kind of classroom they wish, moving easily from lecture to discussion or from seminar to field-work. For each of these styles of classroom design, there is more to it than meets the eye. Lecturing is the basic technique of teaching. At a minimum, every instructor ought to be able to organize the knowledge they want to communicate and deliver it publicly in an effective and engaging way. There are other ways of transferring knowledge, and in some classrooms, these alternatives are more effective than lectures. Lecturing to a class of ten, for example, is not the best use of anyone's time.

Most college teachers know how to discuss a topic with students. As their knowledge base expands, they learn how to ask students deeper or more incisive questions. To get students to participate, instructors use some combination of carrot and stick. Nevertheless, most discussions are deadly dull. Effective discussion, as I will show, is a technique that depends on generating conflict between the students' perspectives. This, in turn, requires creating and sustaining an effective, trusting community among the students.

Seminars differ dramatically from discussion-based classrooms. Discussions can involve the teacher as an active participant and guide. Seminars are usually in the hands of the students. Seminars focus primarily on developing reasoning skills. A seminar is more like a laboratory in which the primary technique of discovery is conversation. Seminars are difficult to design well. They require the self-confidence to trust the process and intervene as little as possible.

Laboratories are the most student-centered classrooms of all. I include every form of cooperative learning environment: scientific laboratory practice, field-based learning, problem-based learning, case-based learning, experiential learning, service learning, and study abroad as kinds of laboratories. These are among the most satisfying teaching experiences because one can observe the greatest amount of transformation in the students.

Advising, like assessment, extends across all classrooms. It is part of the conversation on learning that distinguishes the effective teacher.

The classroom is an important venue for helping a student develop more successful strategies for college. Advising can range from tutoring to mentoring and sometimes even to counseling. The professor has to be prepared to talk to students about more than the class content, or at least to know where to send them for help. Many instructors are unprepared to talk about study habits, career path, or financial difficulties. Advising skills grow as you familiarize yourself with your school's support offices. My aim in discussing it in this book is to lay out the most common issues that arise in the course of ordinary classroom teaching.

The culmination of the class for both instructor and student is the evaluation of student learning and grading. In addition to offering specific advice on how to evaluate students in a timely manner, I discuss grading systems and the construction of essays and exams that will help you to achieve your course goals. This discussion brings us full circle in the design of the course. Seeing teaching as a scholarly activity means using the evaluation of student learning as feedback for the redesign of the course.

Administrative issues surrounding registration and grading can arise in any class. We sometimes face challenges to the grades we assign and instances of cheating or plagiarism. As with the discussion on advising, the goal here is to provide you with resources and information to effectively administer your classes, avoiding misunderstandings of university regulations.

The final section deals with teaching issues that arise at the end of the course. The evaluation of the course and instructor is fraught with anxiety because this information is used in salary, contract tenure, and promotion decisions. If the instructor has done everything he or she can to be an effective teacher, evaluations will improve over time. I am more concerned with making a case that only some kinds of feedback are valuable to helping the instructor improve. While we may ask for specific feedback on readings or projects, the questions I have in mind are relevant in every class. They deal with communication, organization and perceived fairness. The value of course evaluations lies in warning us whenever our students perceive that one or another of these qualities is different from our perceptions.

It is my hope that this extended discussion of the art and craft of college teaching will enable you to develop the answers to the most pressing questions of classroom design and practice. By developing and articulating this philosophy of teaching, you can then explain to

your peers and evaluators how you see teaching as an extension of your scholarship. There will always be as many variations in articulating this philosophy as there are teachers. Classroom design will change as your experience grows. Ultimately, your approach to teaching is a statement of your preferences.

For example, one colleague might describe his or her approach as follows: “Given what I can and cannot control in the classroom, I prefer to set challenges for them that are primarily skill based. I therefore gravitate to courses in the curriculum that permit me to construct seminars and laboratories. If you were to ask me what I would like my students to remember a year after they had finished one of my classes, it would be the experience of working through a complex problem that consumed the better part of the term.”

Another colleague might offer different but equally compelling choices: “Given what I can and cannot control in the classroom, I prefer to invoke the glorious moment of insight that scholars in my discipline have experienced as they worked through the problems that define our field of inquiry. For that reason, I am attracted to courses that permit me to lecture on these moments, so that I can present them with all the drama and excitement that I experienced when I first encountered them. I am committed to getting students to be excited about our field in every class I teach. If you were to ask me what I would like my students to remember a year after they had finished one of my classes, it would be the experience of this excitement.”

Finally, a third colleague might articulate his or her philosophy as follows: “Given what I can and cannot control in the classroom, I prefer to get students involved in debating the great imponderables of our field. I enjoy not knowing what is going to happen next because a student says the unexpected. I call it teaching without a net. It challenges me to be as nimble and as articulate as I can in the moment. For that reason, I am attracted to courses that let me teach ideas through discussion. If you were to ask me what I would like my students to remember a year after they had finished one of my classes, it would be the insights that occurred during some discussion.”

I hope these statements call to mind colleagues you know. Each statement comes from a committed teacher-scholar for whom the classroom is a place of creativity and challenge.

Effective teaching requires a committed teacher, but it also requires a group of willing students. In the next chapter, I focus on the students.

PART
2

What Do We Know About Postsecondary Intellectual Development?

Arguments about the effectiveness of university teaching have been raging since the 1960s, when students charged professors with teaching irrelevant courses. In the 1970s, the criticisms shifted to style. Lecturing, in particular, was attacked as alienating to learners who wanted more hands-on engagement with ideas. For example, researchers found that students on average only remember about 42 percent of the material presented in the hour immediately after a lecture (McLeish 1968). They then forget 50 percent of that within two months (Brethower 1977). In another study, a surprise test revealed that only 17 percent of students recalled the important pieces of the material from the previous week's lecture (Cross 1986, 15). With lecturing representing up to 80 percent of the teaching in universities, students were leaving school with only a narrow and fragmentary knowledge base and little experience in applying that knowledge.

The publication of the book *A Nation at Risk* by the National Commission on Excellence in Education (1983) stimulated research in college teaching. Although it focused on the declining quality of high school students, it put universities on notice that they could preserve the quality of their own programs only through assessing their incoming students and providing remedial classes in writing, reading, and computation skills. At the same time, a rapid shift toward information-based economies placed increased pressure on universities to demonstrate higher outcomes in student learning. A flurry of activity in the 1980s attempted to analyze the university classroom experience and put it in a broader economic context (Association of American Colleges 1985; Bennett 1984; Boyer 1987; Education 1984; Newman 1985).

Bloom and Perry on Adult Learners

While the researchers discussed above looked at what the professors were doing, another group looked at how students learn. Adult intellectual development had received very little attention in comparison to child development. Received wisdom held that the learning component of the personality was fully formed by early adolescence, establishing how the individual adapted to all tasks throughout his or her life. The earliest effort to distinguish between children's lower-level learning and the higher-level learning of adults was the taxonomy of cognitive skills developed by Bloom (Bloom, et al. 1956). The taxonomy begins with knowledge acquisition, such as remembering definitions or formulas. The next skill involves comprehension, demonstrating an understanding of the meaning of remembered information by giving an example or by describing a common context. The next skill focuses on application, using knowledge in a new context or applying it to solve a novel problem. The fourth skill is analysis. This involves a varied set of applications, such as breaking knowledge up into its constituent parts and explaining their interrelationships, understanding the boundary conditions of a category, or distinguishing between the relevant and the extraneous in the relationships between elements. The fifth skill is synthesis, which consists of putting the analyzed parts together to form a new and different whole. Synthesis is involved in any reasoning where the results reflect originality and creativity. Bloom's sixth step is evaluation, the fashioning of criteria to arrive at a judgment of value about knowledge. Bloom hypothesized that as children develop into adults they acquire these meta-skills in this order.

Bloom's taxonomy provides a scheme for classifying question sets and problems for classroom discussion or examinations. The revolution that his followers wanted to launch involved getting teachers to go beyond questioning that stopped at the level of remembering and understanding, challenging students to apply, analyze, and evaluate as well. This taxonomy reappears in different forms in several of the learning models that follow.

In 1970 Perry published a study of adult intellectual development that elaborated Bloom's taxonomy to produce nine positions of cognitive development. Perry carefully called them positions rather than stages. He felt that reasoning was subject matter specific. The beginning of the process was a dualistic style of knowing in which people choose between poles, such as right or wrong, good or bad, and beautiful or ugly. Intellectual development, he believed, could not be separated from moral development. As people grew more aware of the ambiguities of knowledge, they integrated their judgments with their social selves, finding personal meaning in knowledge and reasoning. He was particularly interested in relativist judgments and how reasoning could help one act ethically in multicultural communities. He interposed transitional positions that describe, for example, the progression from dualist thinking to styles that embrace a multiplicity of viewpoints. The end of the process was a mind that could make context-relative judgments based on contingencies that allowed for choice, commitment, and the coexistence of opposing viewpoints, all at the same time (Perry 1970).

When most academics are asked to define the qualities of a critical thinker, they usually express some version of Perry's final stage of development. The importance of Perry's work was to point the attention of researchers to the continuing process of intellectual development in late adolescence and adulthood. Many of his distinctions continue to reappear in altered guises in later models. He was the first to suggest that adult learners are not uniform in their learning styles.

Whitkin and Moore followed Perry in the mid-1970s. They emphasized the context for learning over the moral development of the learner. They distinguished between learners who respond best in social contexts with those who learn best on their own. This is known as the field dependency model. Field-dependent learners, as they call social learners, learn well in collaboration with others and in environments that respond to their emotional as well as their intellectual needs. These learners give the impression of being more holistic in their learning style. Field-independent learners are able to focus independent of the environment. They give the impression of being more analytic in their learning style (Whitkin and Moore 1975). The value of Whitkin and Moore's study was to direct attention to students for whom the social context of learning is a crucial variable for success.

Kolb and Experiential Learning

The search for new learning contexts as a way of characterizing adult learning reached a highly sophisticated stage with Kolb's 1984 book on experiential learning. Kolb is often misinterpreted as having identified four different adult learning styles: Divergers (those who learn through feeling and thinking) learn from open-minded, active reflection on concrete experience; Assimilators (those who learn through thinking and watching) learn from building models and testing these models against experience; Convergers (those who learn through thinking and doing) learn by experimenting by applying ideas to experience; and Accommodators (those who learn through feeling and doing) learn by applying feeling to experience. In fact, Kolb does not see these as separate kinds of learners, but rather as separate phases in a developmental process that all adults cycle through when learning from experience. He understands experiential learning contexts in ways that are very similar to Lewin (1951), Dewey (1938), and Piaget (1970)—namely, as an interaction between reflection and concrete experience that is mediated by emotions.

Kolb (1981) believes that by cycling through these phases, individuals develop specific competencies, such as setting goals, building conceptual models, being sensitive to values, or influencing and leading others. In all, he identifies twenty basic competencies, associating five with each of the four phases. The skills of adults as learners derive from the sum total of their competencies. We should design the adult learning environment, in his view, to facilitate the acquisition of the full set of these competencies. Kolb's views have been highly influential in the development of schools and colleges devoted to the education of returning adult students. They also influence the best practices of experiential learning programs, such as study abroad programs, service learning programs, internships, and immersion programs of various kinds.

Gardner and Multiple Intelligences

The focus of research swung back to the qualities of learners themselves with Gardner's work on multiple intelligences (1993). Gardner says there are eight different ways, or channels, to integrate new information. For an individual, the channel that works the best depends on what Gardner calls domains of intelligence. These domains have little to do with each other. They include the linguistic, the logico-mathematical, the musical, the spatial, the bodily-kinesthetic, the interpersonal, the intrapersonal, and the naturalistic. An individual will have a specific mixture of aptitudes divided among all of these different intelligences. Some may have a disproportionate leaning toward the linguistic or the logico-mathematical. Others may lean toward the bodily-kinesthetic or the interpersonal. All of these learners are likely to turn up in our classrooms. That is a problem, says Gardner, because our classroom learning environments favor the linguistic over all other domains. Exceptions to this are mathematics, physical education, music and art studio courses, and experiential education in tutoring, peer counseling, and Outward Bound. It is not that we dismiss or ignore these alternative channels for learning. Rather, we disproportionately privilege the linguistic over all others.

This is a disadvantage for students whose learning strengths lie elsewhere. It is rare for students to be disproportionately gifted in only one of these domains. The channel that school activities consistently exercise is the linguistic. For this reason, it is often co-dominant with the naturally dominant channel in college students. Gardner argues that effective learning operates through multiple channels, stimulating learning through multiple intelligences. Gardner's ideas have been most influential in K–12 education. Currently, these ideas are entering post-secondary education through the principles of universal design.

Baxter-Magolda and Ways of Knowing

Baxter-Magolda extended the learning context model to gender in her 1999 study. She found that learners cluster into four types: absolute knowers, transitional knowers, independent knowers, and contextual knowers. When she questioned people about their perceptions of their knowledge, patterns that often disadvantage women emerged. Among absolute knowers, men tend to view themselves as possessors and generators of authoritative knowledge. Women view themselves disproportionately as the receivers of authoritative knowledge. Among transitional knowers, women are more likely to begin to relativize knowledge based on interpersonal contexts, while men relativize through impersonal contexts. Gender distinctions disappear in those learners with high social or education attainment. This coincides with independent and contextual knowers (Baxter-Magolda 1992).

One can easily imagine that those social groups who are disadvantaged in the same ways that women are disadvantaged face similar disparities. This social mapping of learning patterns alerts us to yet another level of variation within the learning diversity of our classrooms.

King and Kitchener and the Reflective Judgment Model

King and Kitchener (1994) hypothesized that when people are asked to reveal what they think can be known about the world, how that knowledge is gained and how that knowledge is certified, they simultaneously reveal how they come to believe what is unknowable. Their results suggest a seven-stage reflective judgment model that provides an effective restatement of the “higher order learning as an increasing moral independence” process first described by Perry. People in the first positions are operating under pre-reasoning conditions. Those in the middle three positions are emerging as reasoners. The seventh position characterizes people who are in full command of critical reasoning.

In the initial position, thinking is concrete. People know the world through a single category belief system. Perception is privileged over analysis. Knowledge is predetermined. The possibility of alternative facts or interpretations is denied. Beliefs do not require justification. Knowledge and beliefs are the same thing. “If it’s on the news, it has to be true, because otherwise they wouldn’t put it on” (1994, 47-48).

In the second position, people believe that all knowledge is certain, but that some people do not have access to it. Scientists, teachers and religious leaders know the truth. When facts are uncertain, their habit is to accept authority. Evidence is not a criterion for establishing truthfulness.

In the third position people continue to assert that all knowledge is certain but acknowledge that it is not always apparent at all times. Authority is still the basis of truth in areas of certainty. They retreat to what “feels right” when the facts are ambiguous. Thus, they deflect rather than engage the ambiguities they might encounter while trying to parse complex questions. People in this position cannot distinguish evidence from opinion or belief.

In the fourth position, people insert personal bias to counter uncertainties. If the facts are contradictory, then opinion rises in its rhetorical importance. Bias makes a return to certainty possible. Differences in points of view are the result of upbringing or because of deliberate

mischief in distorting information.

In the fifth position, people bracket some portion of knowledge as permanently uncertain, even in the face of personal bias. Interpretation becomes a part of all understanding. This acceptance of uncertainty marks the beginning of higher-order thinking. Some evidence can be evaluated as stronger and more relevant than other evidence.

In the sixth position, people extend their acceptance of uncertainty to knowledge in general. They see facts as context sensitive, and explanatory narratives as historically contingent. Reaching conclusions about anything becomes strenuous and tentative. Subjective interpretation returns, but in the form of context-sensitive questioning that seeks this time to reveal uncertainty rather than to mask it (1994, 250-54).

In the seventh position, in the absence of objectifiable knowledge, people base their beliefs on approximations of reality using the best available evidence. Interpretations of evidence and opinion can be tentatively assigned to problems of limited scope. Through critical inquiry, it becomes possible to evaluate judgments as having greater or lesser truth value, or that one is a more reasonable solution than another (1994, 70-71).

King and Kitchener see knowledge and reasoning skills as having a coherent relationship. A student cannot make progress as a reasoner without an ever increasing, and therefore ever more ambiguous and uncertain, knowledge base. Simultaneously, the knowledge base cannot expand unless and until the student can reason beyond the bounds of certainty.

Following in the research line established by King and Kitchener, Fischer has developed a model that successfully integrates the learner-centered approach and context-centered approach (1980, 477-531; Fischer and Bidell 1998, 467-561). He stresses the collaboration between the development of higher-order reasoning and the test questions, research problems and essay prompts posed to the learner by the instructor. These targeted challenges are called scaffolds. Scaffolds and scaffolding are terms of art for the design of learner-centered classrooms.

In Fischer's model, the skills that the learner acquires in a previous stage support, or scaffold, the performance of tasks in the next stage. When the performance in one position is poor, performance in subsequent steps will suffer. When the instructor inadvertently poses prompts that are more appropriate in a later stage to learners who are not ready

for them, performance suffers. For example, if a learner has not yet begun to accept uncertainty and ambiguity, high end prompts, such as open-ended or ill-structured problems, they may misinterpret the problem as having a single correct answer. The learner may understand the open-ended nature of the problem but may not yet be comfortable marshaling different viewpoints necessary to “solve” the problem. They will find it exceedingly difficult to prioritize their observations in a thesis statement or central claim. The result is frustration for both student and instructor.

Learners have a problem solving comfort zone. Faced with a prompt that requires skills they do not yet possess, they retreat into this comfort zone. Only when their habitual patterns are insufficient for dealing with the problem do they begin to take greater risks. Fischer calls these self-scaffolding. All real, permanent change in critical thinking skills is self-directed change. Instructors help this along only when they provide challenges that are keyed to the student’s current level of tolerance of ambiguity and then increase the level of ambiguity over time.

What Do We Know About Effective Undergraduate Teaching?

Research has also focused on professors as teachers. The basic question that underlies all scholarship on teaching is “what difference does teaching make to student learning?” Do students learn and grow intellectually because of the teacher, or because of their own efforts? Do they grow as learners because of changes in brain function that would have occurred with or without intellectual stimulation, or because of repeated exposure to lists, plans, procedures, and practices? After all, if teachers play only a small role in the process, then why not just focus on our research agendas and let students fend for themselves with the assistance of more advanced students? Our own experience should remind us that teachers do make a difference in learning. It was a teacher who set us to work on problems, anticipating the intellectual growth that would result from our success and ready to support us if we began to teeter on the brink. It was a teacher who taught us the intellectual standards and modeled for us how those standards should be practiced. It was a teacher who chose the literature that shaped our thinking and inspired our writing. It was a teacher who told us the truth about our accomplishments and helped us set reasonable goals for ourselves.

Research on teaching has resulted in several discipline-based journals on what effective teachers do. Anthologies of these are available. These books cover specific practices that have worked well for college teachers. There is also published research on the cognitive processes that

underlie effective teaching. The reference section of this book contains an extensive, though by no means exhaustive, list of this research.

Effective teaching results when instructors pay attention to perfecting three elements of their classroom practice: communication, organization, and fairness. Communication is not merely clear and unambiguous speech. It is also about performance qualities, the use of texts, and student-teacher rapport. Organization is not merely giving students an assignment calendar that indicates when the exams will take place. It is also about knowing how you will grade an essay before you assign it, limiting the content of the course to what you can effectively communicate, and insuring that there is plenty of opportunity for feedback about the learning process. Fairness is not about teaching and grading everyone according to the same criteria—not everyone is the same. Fairness is about teaching and grading students the way they need to be taught and graded, as individuals with unique capabilities and potentials.

Current Approaches to Understanding Growth in Thinking Skills



In the latest research-based model of adult cognitive development, Wolcott and Lynch adapt King and Kitchener’s reflective judgment sequence to include transitional phases, while incorporating Fischer’s scaffolding scheme. Their approach allows for a more accurate assessment of students’ critical thinking skills. Lynch read a large sample of college writing samples and sorted them into groups based on King and Kitchener’s sequence. From this sort, she developed a criterion-based rubric for using short writing samples to assess the learner’s position in the reflective judgment sequence (Wolcott and Lynch 1997, 59-78). They then devised a set of prompts that provides the appropriate level of challenge for each position.

This model deserves a more detailed description. It represents the best thinking currently available for understanding how we can leverage the variation in student learning in our classrooms into transformative experiences. The discussion of specifics that follow is a summary of Wolcott, Lynch, and Huber's Web publication *Steps for Better Thinking* (2001).

As with previous models, the skill pattern that represents the least complex level of learning looks for the "only" correct answer. These students do not seem to "get it" and complain about this often. They quote inappropriately from textbooks, provide illogical or contradictory arguments, appear unable to read carefully, and insist that the professor, the textbook, or other experts provide them with the "correct" answer, even to open-ended problems. What can be characterized as mixed motivations among general education students in lower-division classes may actually be the higher percentage of these students in those sections. Their motivational problems arise because their reasoning skills do not fit with the demands of the university classroom, even at the introductory level.

At some point in high school or college, self-scaffolding begins to move the student out of this stage into the next one. The key to the transition is the acknowledgment of continuing uncertainty about the nature of facts. King and Kitchener, Fischer, and Wolcott and Lynch agree that this recognition is the way out of the maze of dualistic thinking. Dealing with uncertainty initiates the self-scaffolding process that leads the student to recognize multiple perspectives. This, in turn, is the key to understanding research projects, exam questions, and discussion topics. It also leads the student to use evidence to support arguments, though this is still at a relatively ineffective level.

The position the student is entering with the uncertainty breakthrough is the first stage of what we should recognize, for assessment purposes, as dualistic thinking. Wolcott and Lynch call them Biased Jumpers. Not every form of reasoning, particularly not dualistic thinking, is critical thinking. Students in this position

- jump to conclusions in discussions or papers.
- do not recognize their own biases but are quick to accuse others of bias.
- stack up evidence for their own positions while ignoring counterexamples and contradictions.
- select evidence based on prejudice.

- argue against the counter-position with opinion.
- equate personal opinion with evidence.

These students can acknowledge multiple viewpoints but cannot adequately address a problem from a viewpoint other than their own. They are likely to be confident enough in their skills to speak up often in class, perhaps even dominating discussion. Many are interested learners and engaged in the material.

Eventually, these students tire of the instructor's comments about unsupported generalizations and unfounded biases and move on. The transition to the second position of critical reasoning involves attempts to control the use of personal bias in papers and discussions. As with the acceptance of uncertainty, controlling personal bias provides the key to the next phase of self-scaffolding. Students begin to

- identify issues, assumptions, and prejudices associated with perspectives other than their own.
- evaluate the evidence of these positions logically and qualitatively.
- struggle with how to organize the information in a meaningful way.

It is a struggle that will generate seriously flawed work for a period of time before the students discover an effective organizational pattern. These students are entering the position of critical thinking where they can begin to acquire solid reasoning skills. However, they are blocked from reaching or adequately defending a solution because of the increased mass of evidence they must sift through. They exhibit strong analytic skills but appear to be wishy-washy and noncommittal, unable to formulate a coherent conclusion. Their papers are long and tend to ramble.

These students do not want to stop analyzing. For this reason, their papers can appear to be less structured than those of the previous stage, even though they are thinking more carefully and systematically. During this transition, student work is more vulnerable to being undervalued by teachers than in other transitions. Wolcott and Lynch (1997) noted a tendency nationally to downgrade the work of students at this stage because they lack a strong thesis or conclusion, while upgrading the students in the previous stage because the formal requirements of good paper structure are met, even if the "evidence" is mostly opinion. The advanced students follow through with the process even though it is evaluated less positively than their previous work. Evaluation rubrics that depend on fulfilling a small number of criteria, like the presence or absence of a well-formed

thesis or a conclusion that is more than a summary, can be unduly harsh on students who are attempting to move to a less biased way of thinking.

To succeed in making the transition to the next position, students must avoid getting lost in a sea of perspectives by consciously prioritizing issues and information. This is the key to self-scaffolding for the next position. As with other transitions, the prioritizing will be inadequate or incomplete for some time. Once they have figured out how to prioritize, they will finally be in a position to articulate a well-formed and defensible thesis with appropriate evidence and warrants. Still, these efforts stand out from the larger group of essays written by students at lower skill levels. Successful prioritizers enter the third position of critical thinking where they systematically consider alternatives before reaching conclusions. At this position, students

- focus on finding pragmatic solutions to research questions and give due consideration to what they can accomplish with the available time and resources.
- collaborate with others in the process of setting priorities and may consult with experts or fellow students.
- view the task as finished when they reach the solution.
- make a real effort to evaluate the limitations, changing conditions, and strategic issues associated with a problem.

Students at this stage can sometimes come across as lower skilled because the written work tends to edit out the process through which they attained the solution. However, a careful reading will reveal a complex pattern of investigation that is not present at lower skill levels.

This skill set is probably the practical limit for what most traditional-aged undergraduates in a four-year program can accomplish. This is not to say that in some future curriculum, with a bar set higher, we might be able to graduate students with even higher reasoning skills. The limitation arises because immersion in a knowledge base becomes increasingly important to further skill development. The undergraduate curriculum, even in the upper division of the major, is too diffuse for this immersion. To do well in graduate school, where immersion in the knowledge base is the curricular objective of the first year, students must make an additional transition to professional forms of problem solving. That means that they must

- effectively address the priorities and limitations of their work.
- interpret and reinterpret whole bodies of research findings systematically and over time.