Chapter Twelve

What College Teachers Need to Know

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What do teachers need to know? "Everything!" gasps the novice college teacher. While it's true that teaching is complex, we need not know everything. Yet as teachers, we must be able to integrate the many things we do know into a coherent whole that will bring about student learning. Fortunately, most of the things we need to know about teaching and learning can themselves be learned.

But what are teachers to know? What is the knowledge base for teaching? Is it enough to know the field? Is it developing a repertoire of strategies to use with finesse and confidence? Is it more than talent? Shulman (1987) points out that school teachers' knowledge includes not only knowledge of the content to be taught but also the ability "to reason soundly about our teaching as well as to act skillfully" (p. 325).

What exactly are teachers to reason soundly about? While there are many definitions of teaching, we begin with the presumption that the purpose of teaching is to bring about student learning. From this perspective, then, teaching is arranging an environment in which student learning can flourish. This chapter examines several domains of college teachers' knowledge, implying how teacher knowledge influences the flourishing of student learning. It considers, in turn, knowledge of students and of teaching, knowledge of the discipline and of discipline-specific teaching, knowledge of the context in which teaching occurs, and knowledge of oneself as a teacher.

Knowledge of Students as Learners

Successful teaching focuses first on the learners. The early chapters of this book give helpful insight into the students whose learning teachers want to foster, and other chapters address knowledge of students as well. What else should new teachers understand about students?

Perhaps most importantly, today's college students are probably not very much like what today's college teachers once were as students. They may be younger, but then again today they may not be younger than their teacher. In either case, theirs has been a different life trajectory from their teacher's. For example, the typical college student today is somewhat older than the stereotype, may be employed, will spend longer than four years in college, is probably interested in a profession, and might change majors several times. These interests and life trajectories surely influence their responses to a course. The students may be interested in our field, but perhaps not. If they are not, they may not become excited about the field through the same ideas that drew their teacher; other strategies for enticing students into the subject may be necessary. Students may be well prepared for the course, or perhaps not. Teachers need to remember, however, what Stark and colleagues found: while many teachers in many kinds of colleges believed their students were inadequately prepared, it was impossible to know whether the "unpreparedness" actually resulted from student inadequacies or from unmet (or unrealistic) teacher expectations (1990a).

Knowledge of students as learners and concern about their learning directly influences teaching success. Boice found that teachers who had "decided to see things from the perspective of students and to like students" were happier as teachers, and their teaching was rated better (1992, p. 80). Understanding students as learners grows with experience through thoughtful student contact, with coaching of mentors, from reading about students, with insight into oneself. Most importantly, it begins with discerning appreciation of students as learners.

New teachers can benefit by understanding how students approach learning. For example, consider the model of intellectual development based on the work of Perry (1981) and others (Belenky and others, 1986), nicely summarized by Kurfiss (1988). Many college students expect a course—and the teacher as the "expert"—to provide them with "information," or "the truth," which they will "learn" and then demonstrate on a paper or examination. These students, not understanding intellectual complexity, may frustrate teachers with demands for the concrete ("How do I know if this is important?") when teachers are aiming for the abstract ("Here's an example of how historians work"). Other students are frustrated to realize that in this discipline in particular, or in education in general, many views are expressed, many avenues pursued, many interpretations made. They may retreat into despair at the untidiness of knowledge or reject intellectual rigor and deem all interpretations equally valid. They can foil the teacher struggling to build a searching, intellectual climate in a course. However, with guidance and understanding, students will mature through these phases to understand the criteria by which the multiplicity of arguments may be assessed, "knowledge" defined, and merit determined. They can come to understand how knowledge is context-bound and often value-laden; they can take responsibility for their own knowing and thinking. Ultimately, mature learners incorporate the complexity of a field into their own thinking, arriving at an intellectual commitment toward interpretations they trust and therefore believe they can embrace. Recognizing when students are stuck in this process and bringing them along the path is an important task of teaching. Thus teachers need to understand their students' intellectual evolution in order to foster their learning.

Knowledge About Teaching

Chapters in Part Two of this book offer considerable wisdom about strategies and procedures of teaching. Much of this wisdom rests on a teacher's knowledge of teaching.

What do college teachers need to know about teaching? Centuries of thought and decades of research have yielded innumerable maxims, lists, advice, debate, and prescriptions for effective college teaching. Several years ago, Chickering and Gamson led an ambitious effort to synthesize the accumulated wisdom about pedagogy into a set of principles for undergraduate education (1987, 1991). Their work led to seven principles of effective undergraduate education. What do teachers need to know about pedagogy? These seven principles provide a useful start.

First, students learn from *contact with teachers*. Boice (1992) poignantly describes how the simple act of arriving five minutes early for class and talking with students sets a tone for the class. Although a new teacher may at first feel reluctant about informal conversation with students, the mere act of showing interest—or better yet, checking on students' thinking and progress—can let students know their learning is important. Accessibility outside class and other informal but intellectually stimulating contact with faculty has also been shown to influence students more than we might realize. Office hours, ten minutes for questions after class, study sessions, seminars, even cheery recognition in the hall all matter to students.

Students learn from *real* teacher contact in class, of course. They gain more from a lecture punctuated by pauses for clarification, reorganization, checking understanding, or commentary than they do from the best-organized unbroken monologue. They learn better when they understand what is important, how new ideas relate to their existing understanding, and how to transfer new understanding to other applications. They learn best, too, when

they understand how well they are learning and how to improve their learning (Svinicki, 1991).

Second, students not only learn from contact with teachers but also from *collaboration with other students*. Teachers encourage collaborative learning by arranging the opportunities for students to have contact with one another: study groups, peer teaching, student-directed class segments. Matthews's Chapter Five offers a thoughtful and useful discussion of collaborative learning, and Billson and Tiberius (1991) present both the theoretical and the practical aspects of social arrangements for learning.

Thirdly, students learn more from *active learning* than passive learning. When we think back to our own education, we often most vividly remember a project, a study group, a class simulation, a set of problems. Sometimes "activity" originates with the teacher; sometimes students generate it themselves. Students can even learn actively during a lecture if we plan the lecture to include advance study outlines, mock quiz questions, pauses, demonstrations, opportunities for synthesis, and "one-minute papers" (Cross, 1991).

Because not all students learn best from linear, narrative language, active learning for others can mean their creating a conceptual "map" of the subject matter being discussed, or an algorithm or other depiction of the course content. Suggestions for teachers interested in involving students more actively can be found in many sources, among the best being Bonwell and Eison's (1991) *Active Learning*. Those authors suggest how teachers can move securely from teacher-centered to student-centered teaching without passing through chaos. They also give many practical examples, realistically address the institutional obstacles to more active learning, and suggest what teachers can do about them.

Fourth, student learning benefits from *prompt and constructive feedback*. Students not only learn more but respond more favorably to the course when assignments are planned to help them understand how well they are progressing, when examinations and papers

are promptly returned with opportunities to learn from the results, when individual student contact with teachers provides early assistance, and when teachers provide students with specific, positive, and substantive responses to their thinking and work.

Fifth, students benefit when they devote *focused and sustained attention* to the substance of the course content; this attention is called "time on task," implying simply that both in-class and out-of-class time should focus on the subject matter. The academic work of college learning—the weekly problem assignment, in-class exercise, term-paper assignment—is designed carefully so it will bring students into contact with the subject matter in ways that will make the course content accessible. While it is easy to plan academic work to fit our own purposes (such as providing defensible evidence for grading), it is better to plan work that will demonstrably benefit students. Moreover, because much of college students' academic work takes place beyond our control, we must be especially sure that the time they spend on these tasks will further their learning.

Sixth, *clear communication of high expectations* contributes to student learning. Clear communication means that students understand what teachers have in mind. The only way a teacher can be sure about this is to check frequently, either by talking with students about the expectations themselves, or by early, frequent, and constructive review of student work, or preferably both. High expectations foster learning when they are both attainable and challenging. High expectations that are uninspiring and incomprehensible not only obstruct student thinking but by wasting their time give students messages about the course that no otherwise-well-intentioned teacher can erase.

Lastly, effective teachers also acknowledge and act on their students' *diverse talents and ways of learning*. They select course materials and design their teaching to accommodate the students' preparation and comprehension. They offer a variety of instructional approaches. When students don't understand, their repertoire includes other ways to explain, depict, or illustrate. The vast and challenging diversity of student backgrounds and talents implied in Upcraft's second chapter in this book, and in Tierney and Bensimon's later chapter, illustrate this principle.

Knowledge of the Discipline

College teachers teach subject matter: organic chemistry, art history, cultural anthropology, accounting. The field not only represents an academic specialization, it also provides the lens through which the academic views life itself. The discipline thus influences teaching not only in selection of course content but in the teacher's very thinking.

Donald (1987, 1990) has confirmed that teachers in varied disciplines differ substantially in the ways they conceive of the nature of the concepts of their fields, the fields' logical structures, their organizing principles for truth criteria, and their methods of inquiry. A teacher therefore must know not only the obvious—the field's substantive content—but also how the field frames the substantive content. Teachers do, as Stark and others (1990a, p. 162) explain, "draw heavily upon their background and expertise to make planning decisions, using their academic field as a foundation for content selection, arrangement, and conceptual integration." This being so, teachers must not only know the substance of the discipline but also its shape and character, its logic and epistemology.

A disciplinary body of knowledge can be divided in several ways. Grossman, Wilson, and Shulman (1989) quote Dewey's (1983) observation: "Every study or subject thus has two aspects: one for the scientist as a scientist; the other for the teacher as teacher. These two aspects are in no sense opposed or conflicting. But neither are they immediately identical" (pp. 285–286). Grossman, Wilson, and Shulman (1989) suggest three aspects of teachers' knowledge of their field. First, teachers must be knowledgeable about the content. When beginning teachers do not know (or do

not think they adequately know) the field's content, they often lecture impersonally, avoid eye contact, discourage discussion, misdiagnose students' thinking, and avoid some topics.

Second, teachers need to understand a discipline's substantive structures, "the explanatory frameworks or paradigms that are used both to guide inquiry in the field and to make sense of data" (p. 29).

Third, teacher knowledge must include the field's syntactic knowledge, understanding of "the ways in which new knowledge is brought into the field" (p. 29). Without this deeper understanding, teachers can parrot information about the course content, but in the end they will be unable to help students understand and assimilate the field's complexities.

As teachers, we seldom separate knowledge from beliefs about our discipline and teaching it. We may believe, for example, that cultural anthropology or Asian history provides the key to understanding the human experience. Our beliefs may be supportable as claims on knowledge, or they may not. It is important for teachers to recognize beliefs as beliefs, and to examine them as rigorously as we examine our disciplinary knowledge itself.

To teach effectively, then, teachers draw upon not only the substance of the field (a set of equations, an author's typical themes, a school of painters) but also its paradigmatic bases, its syntactic structures, and their own beliefs—all of which deserve thoughtful attention. Teachers need to reflect upon the diverse ways their own discipline can be viewed, how their own professional preparation has brought about their knowledge of the subject matter, how they themselves view the field, what they believe about education in the field, and how these beliefs influence their teaching.

Discipline-Specific Teaching Knowledge

A further form of teaching knowledge lies at the intersection of content and pedagogy. Effective college teachers concern themselves in a scholarly manner not only with the discipline's content

but also with how that subject matter is most effectively taught. How can a teacher transform the course content to make it ready for effective instruction (Shulman, 1987, p. 326)?

How should a teacher design and manage that instruction? A teacher's understanding about teaching a *particular* subject matter has been termed "pedagogical content knowledge" (Shulman, 1987, p. 327). This term refers to such questions as these. How is this particular subject matter best connected to students' minds? Should course content be arranged according to the field's conceptual relationships in the real world? Should it be arranged according to how students will use it in social or career settings, or how the field's major concepts and relationships are theoretically organized, or to how students learn (Stark and others, 1990b)? "What analogies, metaphors, examples, demonstrations, simulations, and the like can help to build a bridge between the teacher's comprehension and that desired for the students?" (Shulman, 1987, p. 328). When should a teacher select one approach for teaching about a topic, and when is another approach better? Does cooperative learning benefit students studying this topic, or are simulations better? How can the material to be learned be adapted to these students' past experience? "What student conceptions, misconceptions, expectations, motives, difficulties, or strategies might influence the ways in which they approach, interpret, understand, or misunderstand the material?" (Shulman, 1987, p. 329).

An introductory college algebra teacher needs to understand, for example, students' typical conceptions of algebra and how prior mathematics experience influences these conceptions, the many strategies students use to solve different kinds of problems, the varied ways texts represent problems to students and how students respond to each, the kinds of difficulties students face when confronting new concepts, how students will falter and succeed when problems are presented in differing forms, and how students' understanding of college algebra can be shaped to help them in later

courses. This knowledge will be different when the mathematics teacher moves into a calculus course.

A government professor may teach political economics in one way because she knows how the subject matter is best transformed for student understanding, but she may design a course on the political process entirely differently.

A psychology statistics teacher needs to know that beginners will stumble when they encounter the concept of "standard deviation" and must know how to represent that important topic to overcome the barriers and smooth the way for its later appearance in more elaborate forms.

Learning how to be an effective teacher of subject matter X does not guarantee effective teaching of Y. Having been an effective teacher of art history does not guarantee success in the beginning watercolor studio, even for an accomplished watercolorist. Indeed, having been an effective teacher of medieval art history does not guarantee success in teaching twentieth-century art history (although it will certainly help). There is no guarantee, not only because a teacher might be more expert in one than the other, but (more importantly) because there are differences in the most effective ways to represent medieval versus twentieth-century art history and to transform one or the other into student understanding.

How do college teachers gain this discipline-specific knowledge about effectively teaching a specific field? Beyond the two prerequisites—knowledge of the content to be taught, and knowledge of pedagogy itself—college teaching experience provides many lessons. A teacher knowledgeable about students, student preconceptions and difficulties with the subject, alternative learning strategies, and alternative means of representing the subject matter will approach subject matter thoughtfully and flexibly.

To supplement sheer experience, college teachers can learn the discipline's specific teaching knowledge by careful research. Teachers can learn particularly well from others, most likely colleagues in their own field. Many talented and experienced college teachers have learned through years of practice how their discipline is most effectively translated into students' learning. Newer teachers can co-teach, or they can systematically observe and interview experienced teachers to find alternative ways to represent the subject matter and to discover students' sources of difficulty with it. Teachers can look at a variety of texts to see how the subject can be organized, how difficult concepts can be represented, and how specific illustrations can help students grasp the field's complex ideas.

Gaining this essential knowledge is a significant intellectual process, rather than a talent. Being adept at intellectual inquiry, college teachers can be as inquiring and analytic about this new knowledge as about their research and creative work. Content-specific teaching knowledge can be learned.

Knowledge of the Context

Teachers teach and students learn course material not in a vacuum but in a context: the context of the department or program, of teaching colleagues, of resources.

Few courses exist independently of a program context. Teachers therefore acknowledge that context, and they plan their teaching within it. Stark and others (1990b) found that teachers' course planning was most influenced by the goals of a program or department, the general responsibility of the program to the institution's goals, and the requirements of courses that students would take later. What teachers need to know, then, is how to plan a course to fit into a larger curriculum so that students can move with confidence from one course to the next. (Occasionally, a teacher will plan a course to contrast with the program's usual purposes or viewpoint, so that students will be exposed to an alternative paradigm or interpretation. To manage this kind of course successfully, the

teacher must understand the program context even more thoroughly.) Knowing the program context for teaching requires detective work, for we do not always know the details of our students' prior work in other courses or the nature of the courses they will take later. Yet knowledge of these two is essential for effective course planning. Administrators such as department heads are responsible for helping new faculty understand and work within these contexts.

Teaching in the context of a program also means teaching in a collegial context. Because a program or department is a collection of individuals, those individual colleagues influence our teaching in important but indirect ways. Sometimes an entire faculty's teaching habits—perhaps expressed as "delivering the content" rather than stimulating students' learning—can narrowly define what is expected from teachers and discourage change (Grimmett and MacKinnon, 1992, p. 390). The program's grading patterns are important too, particularly for new faculty. The department's instructional habits may be traditional or visionary; in either case new faculty members need to know how their own teaching fits with department patterns. Again, the institution bears some responsibility in seeing that new faculty understand these contexts. Boice (1992), who found obstacles to collegiality formidable for new faculty, emphasized that early involvement with colleagues concerning teaching paid off for beginners, even though talking about teaching is rare.

Teachers need to know the practical contextual constraints, too. Austin and Sorcinelli (1992) emphasize how important it is for junior faculty members to understand institutional expectations and resources. What kind of assistance can a teacher expect from the department office? Are there constraints on use of photocopiers for class handouts? If so, is there a campus copy center where handouts can be distributed? How are book orders managed? How does the library reserve reading room support courses? When are next

year's courses scheduled and rooms assigned? Teachers must know the pedestrian as well as the esoteric, the concrete as well as the abstract.

Knowledge of Oneself as a Teacher

While "know thyself" is good advice for anyone, college teachers truly must know themselves because they confront themselves at every turn. "Shall I spend the rest of the afternoon developing more class handouts, or doing a literature search at the library?" "How should I answer that student's question?" "Is it OK to avoid interruptions by working at home one or two mornings a week?" "How can I negotiate with my department chair?" "Do I automatically assume that students are trying to evade work?" "Why do I feel like an outsider?" "I'm so uncomfortable with discussions in my freshman class!"

The first term, the first year, and even the first few years of college teaching, while exciting and rewarding, also bring isolation, insecurity, and unaccountable "busyness" (Boice, 1992). New teachers need to work consciously to find collegial support, intellectual stimulation, and professional friendships, to realize that this will take time, and to count this as productive, important time. Some campuses support these efforts, but most, alas, do not. Even if the campus doesn't help in this search, new teachers must privately acknowledge that the search is central to well-being as a teacher. Time and energy devoted to collegiality are time and energy well spent.

Time management challenges the college teacher as never before. While new teachers typically see their time problem as being not enough time (Sorcinelli, 1992), in fact the issue of time is much more complex. Course preparation can consume all of life, but that temptation should be resisted. Boice (1992) found that new teachers "who persisted in trying to come up with better and

more error-free lectures made little progress in finding comfort, student acceptance, or time for other activities. Those who moderated and balanced time spent on teaching preparation fared far better as teachers" (p. 80).

Teaching style develops over time, and it can differ from one subject matter to another. Finding one's best style of teaching requires experimentation and reflection ("Well, I can see that lecturing and *then* expecting discussion didn't work!"). Sometimes new teachers feel fragmented because they find they teach inconsistently; one day the students actively pursue simulated problems, and the next the teacher must lecture. It may be small consolation, but all good teachers experiment and reflect on the results, and they refine their teaching style accordingly. Most important, effective teachers monitor their own teaching: experimenting, reflecting, using feedback, changing.

Teaching style is but an extension of personal style itself. Because one has never been anyone else but oneself, it's often difficult to imagine other styles of working, of learning, of thinking. Yet in order to understand students and to communicate with them, one must first understand oneself. For example, many academics are energized by working in solitude, reading late into the night, or sitting hunched over the word processor for hours; yet the majority of adults learn better in interactive, social settings. Many academics are verbal, linear, precise, logical; while some students are like them, others are visual, graphic, artistic, intuitive, kinesthetic. The teacher who learns one way finds it hard to imagine how students could learn in other ways, and in trying to be helpful ("This is how I learned it") he or she can easily give advice exactly contrary to a student's needs.

Knowing oneself as a teacher can seem an insurmountable task. Chapter Ten in this book offers helpful advice on seeing oneself through information from students and peers. Understanding oneself requires diverse sources of information. Information from students can come from small feedback groups, end-of-class one-minute student comments, or formal evaluation programs. Information from peers can come from observation by local colleagues, consultations outside class, and through asking colleagues at other colleges to review teaching materials.

Beyond the help of friends, colleagues, and professional teaching specialists, one of the best sources for understanding oneself as a teacher is a good mentor. Unfortunately, because few campuses can point to sound, established, widely used teaching mentor programs (Boice, 1992), teachers might have to arrange good mentoring themselves. A good teaching mentor agrees to spend time with the new teacher, to share experience and encouragement, to observe and be observed, question and be questioned. A good teaching mentorship is planned: it includes scheduled elements as well as unscheduled encounters, joint experimentation as well as emulation (Schön, 1987), periods of active involvement as well as other periods of distance. A teaching mentor helps expand one's vision of oneself.

Those Who Can, Do; Those Who Understand, Teach

The head for this section shows how Shulman (1986, p. 14) twists George Bernard Shaw's aphorism, calling on teachers to "understand." What does a new teacher need to understand? The content of the discipline, surely—including not only its facts, concepts, and organizing principles but also its explanatory frameworks and syntactic structures. Also, a teacher must have the specialized understanding about learning the discipline that is specific to the field, that is, the particular context for teaching. Insight about today's students in general and in particular about students as learners is important, as is wisdom about ourselves and how our talents, styles, fears, and beliefs influence our teaching.

Understanding these complexities sends us on our way as teachers.

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