Yet Another Report About Teacher Education?

In *Preventing Reading Difficulties in Young Children,*[1] enhanced teacher education was identified as a key strategy in improving reading instruction and thus reading outcomes. *Preventing Reading Difficulties* was based on an extensive review and synthesis of a rich research base on reading development. Writing an equivalent report that might be called *Preventing Instructional Disasters in Novice Teachers' Classrooms* would have a much less rich basis in directly relevant research. Many of the claims in such a report would have to be inferred from evidence about children's literacy development, such as that reviewed in *Preventing Reading Difficulties* and in the *Report of the National Reading Panel* (National Reading Panel, 2000). The link from evidence about child accomplishments and effective instructional practices to required teacher knowledge and effective teacher education requires a fairly high level of inference.

Of course, the fictive *Preventing Instructional Disasters* could draw on information such as that reviewed in the National Research Council report *How People Learn* (Bransford, Brown, and Cocking, 1999) about how real, transferable, usable knowledge is acquired, both by adults and by children. It could also draw from the growing body of information about effective and ineffective strategies in teacher education and professional development that is based both

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[1] A National Research Council report (Snow, Burns, and Griffin, 1998).

in the wisdom of practice and in systematic reviews of successful preservice and inservice teacher-education programs.

Unfortunately, though, all these sources of information add up to less clarity than we might wish to have about the optimal design of teacher education to ensure adequate preparation for all teachers in literacy. We simply do not have the research base we need—a convergent program of research in which content and method in teacher preparation or professional development programs have been manipulated, and accompanying changes in teacher knowledge, teacher behavior, and child outcomes charted. Nor can we wait for that research base. Teachers are being prepared in their thousands every year, and the projected need for new teachers is enormous. Thus, we are impelled to take the relevant information available to us as a basis for recommendations about how to prepare teachers to teach reading more effectively. We offer these recommendations as working hypotheses, with the full recognition that they will need to be constantly evaluated along the way. In other words, teacher educators must start working the way excellent teachers work, by imposing on their own profession a recurrent cycle of *learning, enactment, assessment,* and *reflection.*

Nor should the lack of a fully specified research base discourage us regarding the value of what we do know or the appropriateness of much current practice in teacher education. Medical education, in which professionalization and high standards were introduced in a rather draconian fashion as a result of the Flexner report (Flexner and Pritchett, 1910) and which is often cited as a model for reform in teacher education, has never been subjected to systematic assessment. The content of what is taught in medical schools is defined by "science-based medicine," but medical faculties are experimenting all the time with variations in how to make the learning more efficient and more connected to clinical practice, at the same time preparing M.D.s to function as doctors and to engage in continued informal and formal learning (Tosteson, Adelstein, and Carver, 1994).

We take as a central process in any educational effort the learning, enactment, assessment, and reflection cycle—a cycle of activities in which learners start with what they know, but are committed to assessing efficacy of the enactment of that knowledge in recognition that what they know is insufficient. This cycle applies as much to those of us educating teachers or providing guidelines for teacher education as to those learners starting on the road to certification as teachers. What would this cycle look like for teacher education? It would mean enacting a form of teacher education that is based as firmly as possible on what has been learned from research, assessing systematically the effectiveness of that education, reflecting on where it has fallen short and how it could be improved, thus generating new learning which in turn starts the next cycle at a higher level. In this book we offer a set of recommendations for the design and enactment of teacher education based on what is currently known

from research about literacy development, literacy instruction, and student and teacher learning. Needless to say, we accompany this sketch of enactment with an exhortation to attend to the assessment and reflection components of the cycle in enacting these recommendations.

The urgency of our recommendations is enhanced by the consensus among national organizations focusing on education that a new design for teacher education is needed. Commissions, committees, and reports focused on teacher education have been launched by the American Educational Research Association (AERA), the International Reading Association (IRA), the American Association of Colleges for Teacher Education (AACTE), and by the National Academy of Education (NAE). The NAE established a Committee on Teacher Education (CTE), chaired by Linda Darling-Hammond and John Bransford, to prepare a report providing a comprehensive picture of the requirements for improved teacher education. That report, *Preparing Teachers for a Changing World: What Teachers Should Learn and Be Able to Do* (Darling-Hammond, Bransford, LePage, Hammerness, and Duffy, 2005), constitutes the context for this book, which focuses specifically on the knowledge about literacy that all teachers need to have. This report builds on the advanced degree of consensus within the field of education concerning the characteristics of good literacy instruction. The content specifications for this literacy report can build on a broader base of research than would be the case for fields such as math, social studies, or science.[2]

Writing a report like this is not, of course, a novel undertaking. A number of attempts have been made to sketch the teacher's required knowledge base for teaching reading—several with participation by members of this very committee. As one member put it at a planning meeting, "I can't stand the thought of producing another list of things teachers should know and don't"—a sentiment all of us recognized we shared as soon as it was uttered.

How is this report, then, different from its predecessors? It is, first of all, emphatically not a list. It grows out of a developmental view of adult learning that specifies various stages or levels of knowledge, and that presupposes the development of structures to support the learning of teachers across their careers, comparable to the developmental view of child learning endorsed in *Preventing Reading Difficulties.* Second, it focuses on usable knowledge—thinking about how to ensure that teachers develop real, practice-based, useful knowledge rather than the sort of knowledge that is easy to assess but hard to use. Third, it tries to represent the required knowledge systemically, in a way that makes

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[2] With the release in 2002 of the RAND report on mathematics, which focuses on issues of teacher education for teaching math, one might think that math teaching falls into the same category as literacy teaching (Ball and RAND Mathematics Study Panel, 2002). The RAND report recommendations, though, mostly specify the research agenda needed to figure out what kinds of preparation math teachers need and profit from, rather than specifying what they need to know.

Exhibit 1.1. Previous Reports on Preparation of Literacy Teachers

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Teaching Reading Is Rocket Science (Moats, 1999)

Teaching Teachers to Teach Reading: Paradigm Shifts, Persistent Problems, and Challenges (Anders, Hoffman, and Duffy, 2000)

Reading Teacher Education in the Next Millennium: What Your Grandmother's Teacher Didn't Know That Your Granddaughter's Teacher Should (Hoffman and Pearson, 2000)

Features of Excellence of Reading Teacher Preparation Programs (Harmon, Hedrick, Martinez, Perez, Keehn, Fine, and others, 2001)

What Teachers Need to Know About Language (Fillmore and Snow, 2002)

Preparing Our Teachers: Opportunities for Better Reading Instruction (Strickland, Snow, Griffin, Burns, and McNamara, 2002)

Standards for Reading Professionals (Revised). (International Reading Association, 2003)

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clear how disciplinary knowledge (in this case, drawn both from the various hyphenated-linguistics disciplines and from the cognitive psychology of reading) does and does not shape and dictate teacher knowledge. In this chapter, we describe the structure of our thinking about the following things: adult development; the characteristics of and prerequisites to usable knowledge; and the contributions of cognitive psychology and linguistics, which we take to include psycho-, socio-, and discourse-linguistics, to the definition of the knowledge teachers need to teach literacy effectively.

For each of those three areas we also discuss the warrants for arguing that they are worth attending to. As noted earlier, those warrants do not typically derive from experimental studies demonstrating impact or effectiveness. They often derive from somewhat more indirect arguments. Thus, we are proposing two linked activities: changes in teacher education and professional development, and evaluation of those changes through assessment of teacher and student learning at every stage of the change. Like improving reading instruction, improving teacher education is an inherently empirical undertaking.

ADULT DEVELOPMENT AND TEACHER CAREERS

In *Preventing Reading Difficulties in Young Children,* a contrast was drawn between traditional readiness models of reading and current emergent literacy models. Readiness models see reading as a product of instruction that should

only be introduced after certain maturational milestones have been reached. Emergent literacy approaches, however, emphasize the many accomplishments of very young children that are directly related to literacy development—learning about the functions of print, learning about how language is used differently in written and in spoken language, starting to enact writing with scribbling and reading with recitation of the text of familiar picture books, and learning to recognize some letters and some printed words. Whether one wants to identify these accomplishments as "literacy" or not, it is clear that they represent knowledge and capabilities that the maturationist, readiness view would render invisible.

Similarly, we argue that the traditional, and still widely accepted, view of teacher education is one that is too dominated by the identification of sharp shifts in status and hypothesized accompanying shifts in capacity. Young men and women are certified as teachers after a certain number of courses in education and some prescribed number of hours of supervised classroom experience. As soon as certification requirements are achieved, these women and men are given the full list of responsibilities associated with being a teacher—a classroom full of students, considerable choice (in some places) among curricula, partial to complete control over the scheduling of the students' learning activities, accountability for classroom management and for student progress, freedom to refer children for evaluation for special services, and a very high level of autonomy. Such teachers are very unlikely to receive much supervision or, unless they are good at seeking it out for themselves, much consultation or advice. Having achieved the status of certified teacher, they may well then continue in that status for forty years, with no systematic opportunity to move toward a higher degree of qualification, to fill in areas of knowledge that might have been skimped on in their preservice programs, or to become acquainted with newly emerging research findings.

We argue that this *status-shift* view of teacher development accords poorly with what we know about adult development, human learning, and the description of the knowledge domains teachers need to acquire. Compare the teacher-education model to other forms of professional preparation. An aspirant barber in Massachusetts studies for a thousand credit hours over seven to ten months, engaging in supervised practice for up to fifteen hours a week during the "preservice" phase of training, then must operate for a full year in a shop under the supervision of an experienced barber before being allowed to open an independent business. An aspirant medical doctor in the United States is required to cover many hours of premedical, basic science training and pass an exam to qualify for entry into medical school, then to engage in three years of full-time study including increasingly challenging tasks involving patient contact, then to fulfill a full year's internship, before even being allowed to treat a patient without supervision; M.D.s seeking specialization may experience another several years of supervised practice and practice-based learning.

It is striking that teacher preparation resembles barber preparation more than medical preparation—and even then falls short in the amount of supervised practice required before independent action! The aspirant M.D. goes through at least three, and often five, developmental stages, whereas the average aspirant teacher has only two—precertified and certified. Of course, induction-year programs are widely recommended, but they have been effectively implemented for only a tiny proportion of new teachers—far fewer than the number that enters teaching without even having completed a preservice certification program! The single status-shift model for teacher career development places an enormous burden on the preservice program, requiring that it provide far more knowledge and practical skills than anyone could reasonably acquire within a few short years. It also rests on the myth that what teachers need to know is a fixed body of knowledge—that a systematic procedure for ensuring access to new evidence and new conceptions is unnecessary. Most devastatingly, though, it conflicts with the conception of the teacher as a lifelong learner who could be motivated and should be rewarded by recognition of status changes throughout the length of a career—from novice teacher to collaborating teacher to master teacher to coach, for example—especially if those status shifts are accompanied by increases in remuneration and responsibility.

The incentive structure of a career-long developmental pathway for teachers is not the most important reason to propose this model. More compellingly, a model like this fits with our presupposition of *progressive differentiation* as a general framework for thinking about teacher education. *Progressive differentiation* refers to a process of development in which the capacities being used at any point are analyzed and elaborated, in response to evidence that they fall short. Thus, for example, a novice teacher's skillful use of a prescribed, well-structured literacy curriculum represents a developmental accomplishment; the teacher's recognition that the curriculum is not being effective with a subset of the children in her or his first-grade classroom (for example, the English-language learners, or ELLs) generates an opportunity to analyze the curriculum, to think about the skills it presupposes, and to design supplementary or alternative teaching models for the ELL children. The teacher's skill in using the curriculum is not superceded, but rather analyzed and elaborated, leading eventually to a reorganization of her or his enacted knowledge into reflective knowledge.

We distinguish five levels of increasing progressive differentiation roughly correlated with five points in the teacher's career progression: preservice, apprentice, novice, experienced, and master teacher. Teachers at each of these points on their developmental and career trajectories should be engaged in cycles of learning, enactment, assessment, and reflection, though the weight placed on each of these activities shifts with experience. Clearly, preservice, apprentice, and novice teachers are most heavily involved in new learning, whereas experienced and master teachers are placing more emphasis on assessment and re-

flection. But each of the steps in the cycle is crucial for all. We can describe five points in a teacher's development by characterizing the type of knowing that dominates at each point. Figure 1.1 is a representation of how those different types of knowledge might be distributed at various points in a teacher's career. Remember, though, that the total knowledge available grows.

Declarative Knowledge The student pursuing an education major or certification program is primarily engaged in acquiring declarative knowledge (learning, from books or lectures, about child development, about instructional approaches, about text analysis, and so on) and in acquiring a declarative version of procedural knowledge—the capacity to answer questions about what one should do in various situations. This stage of knowledge development is when a solid foundation of disciplinary knowledge relevant to success as a teacher will typically be acquired; given constraints of time and energy, that
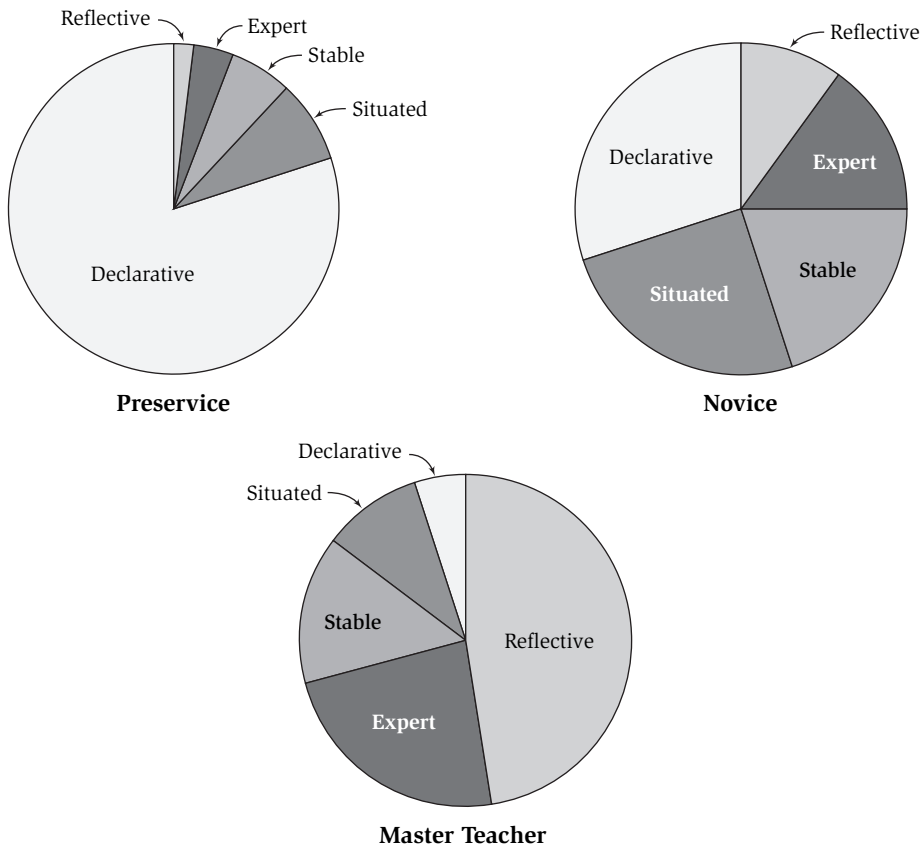

Figure 1.1. Knowledge Representation at Three Points of a Teacher's Career

places on teacher educators the burden of being analytical about precisely what that knowledge must be.

Situated, Can-Do Procedural Knowledge. It is a commonplace observation that declarative knowledge is an inadequate basis for good practice. Having successfully answered a test question about what to do when one's car starts to skid does not ensure that we avoid slamming on the brakes and remember to steer into the skid the first time we hit black ice at sixty miles per hour. Similarly, having studied the normative progression of children from prereading to conventional reading does not ensure that a first-grade teacher can identify precisely where on that developmental progression the children in his or her class are or can know how to arrive at the best instructional response to each of their needs. Procedural knowledge is complex, and we distinguish between the level of procedural knowledge required to function effectively in a relatively simple situation, for example, as a teacher of a small homogeneous group of children or in a highly scaffolded situation (for example, with support from an excellent mentor teacher) and the level needed for independent functioning in a typical U.S. classroom.

Stable Procedural Knowledge. The well-prepared first-year teacher should have a level of declarative and procedural knowledge stable enough to support functioning under "normal circumstances"—she or he can plan instruction that will work for the majority of the class, can maintain order and implement the planned instruction, can assess child progress, and can adapt instruction within the limits of "normal practice." Such a beginning teacher might well be expected, though, to need help in designing and delivering instruction for some percentage of children in the class—those who come from an unfamiliar linguistic or cultural background, those who don't respond to the standard instruction, and those encountering particular difficulties learning to read. The "well-started novice teacher" needs a well-structured, reliable set of supports to deal effectively with such children—supports not only for the benefit of the children, but also supports to student learning that build in opportunities for teacher learning. Think of the analogy with the resident confronting his or her first case of diphtheria or beri-beri, who is expected to request help in diagnosing and treating it and to learn from that experience how to treat the next case.

Expert, Adaptive Knowledge. The experienced teacher is expected to be able to deal with a full array of instructional challenges, to identify problems for which the current knowledge base offers inadequate guidance, to seek new relevant research-based knowledge, and to incorporate that knowledge into his or her knowledge structures. The experienced teacher should have a role in the school that acknowledges and uses his or her experience—supervising student

teachers, of course, but also mentoring novice teachers, taking a leadership role in teacher learning groups, and serving as a consultant for students who present particular challenges.

Reflective, Organized, Analyzed Knowledge. The master teacher has enough experience to analyze what she or he has learned in courses, read in books, or heard at professional conferences and evaluate it as useful or not, well-founded or not. The master teacher is, ideally, responsible for leading professional development activities within a school or department, is available as a consultant teacher to less experienced colleagues, and is, perhaps, even collaborating with faculty members in preservice programs to design and deliver teacher-education courses.

We argue that the quantity and complexity of the declarative and practical knowledge teachers need to be successful teachers of reading is so great that it simply cannot be mastered adequately in the brief time available during a preservice program. At the same time, preservice teachers can learn enough about teaching reading to do it adequately for many child learners, if provided with a decent curriculum and a reasonable level of support. With the help and consultation of a more experienced teacher, novices should be able to address the needs of most of the children in any classroom.

We argue, in short, that it is crucial to conceptualize what teachers need to know to teach reading within a developmental framework: How much is needed so that novice teachers at a bare minimum do no harm? How much is needed for a teacher to be in charge of selecting curriculum, and individualizing instruction, independently? How much is needed for a teacher to be a reliable resource for one's colleagues, or to be the person who evaluates teacher performance and designs professional development?

For this report, we specify only a couple of these levels—novice and expert. Of course, these five levels should not be thought of as "stages" separated from one another by sharp discontinuities in knowledge. Rather, they represent points on a trajectory during which knowledge becomes increasingly differentiated and subject to analysis.

DISCIPLINARY BASES

Reading is, at its basis, about language and about thinking. We read language; orthographic systems are ways of representing the spoken language, and characteristics of languages determine to a significant degree how they will be written down. Thus, we start with the claim that prospective teachers of reading need to know something about language structure—systems and subsystems. We recognize as well that courses in linguistics are not typically well-suited to

the needs of teachers, precisely because they do not, in general, present knowledge about language in a form that is directly usable.

The linguistic knowledge base for teaching reading is often scanted in teacher education, perhaps because it is seen as too complex and technical. Linguists distinguish a variety of language systems—separate rule systems, each with its own unit of analysis, constraints, and criteria for correctness. These are, for the formal linguist, phonology, morphology, syntax, and semantics. Sociolinguists or anthropological linguists might add pragmatics, which encompasses the expression of communicative intents, conversational rules, and discourse rules. Historical linguists would certainly add etymology to the list. Descriptive linguists would include orthography. (Chapter Two gives a more extended description of each of these domains.)

Cognitive psychologists and psycholinguists would chime in at this point that understanding the language system requires understanding something about how it is used. Language use encompasses many topics—how normal speakers acquire language; process oral and written language for comprehension; generate spoken language in real time; remember information presented linguistically; and segment, identify, formulate, and retrieve meaning for words, expressions, syntactic structures, and texts. In addition, understanding language use requires attention to the ways congenital or adventitious language disorders disrupt various aspects of linguistic functioning. Language is used, furthermore, in somewhat different ways in different fields—historical texts differ in predictable ways from literary or scientific texts, and the discourse rules for various disciplines are clearly distinct. In fact, to some extent the discipline-appropriate use of language functions to define the ways of thinking appropriate to those disciplines and to define the language user as a qualified historian, literary analyst, or scientist.

Psycholinguists would also point out that many speakers progress beyond knowing how to use language as a system of communication, achieving the metacognitive capacity to reflect on language. The capacity to be meta-analytic about phonological structure is directly relevant to understanding alphabetic writing systems and producing puns. The capacity to be meta-analytic about grammatical structure is helpful in comprehending text, understanding structural ambiguities, analyzing style, and revising written texts. The capacity to be meta-analytic about discourse structure is key in literary analysis, in learning from text, and in appreciating differences in text associated with genre and with culture.

Developmental psychologists, furthermore, would emphasize the need to understand the development of these various language systems and functions, as well as the development of knowledge specific to literacy, such as characteristics of the orthographic system and of written language. Indeed, for teachers engaged in the learning, enactment, assessment, and reflection cycle, having acquired a conceptualization of the larger developmental trajectory along which their students are progressing is key to their capacity to enact instruction, to assess appropriately, and to reflect productively.

So are we proposing that future teachers need to study language divided up into these many subcategories of linguistic, hyphenated-linguistic, and cognitive analysis? No, that would violate our commitment to building teacher education on *usable knowledge*—knowledge that is embedded in practice rather than being isolated from it. But we are suggesting that having a sense of the full range of options within a systemic and systematic view of language will help teachers start on their journey to fully differentiated and fully implementable knowledge.

USABLE KNOWLEDGE

There are years' worth of fascinating things one could learn about the cognitive psychology of learning, about linguistics, about social and motivational development, and about other topics relevant to teaching children to read. Indeed, some people devote their entire lives to these disciplines. But considerable work is needed to make the knowledge they generate usable for practitioners. The challenge of sifting the usable from the merely interesting is huge and constitutes one of the reasons that teacher education is so hard to do well. Those best equipped to define what is usable, namely experienced and reflective practitioners, are typically not the best steeped in the disciplinary knowledge base. Those most knowledgeable about the disciplines are ill-equipped to decide what aspects of it are usable (see Burling, 1971, for a linguist's reflections on teaching linguistics to teachers).

The traditional, rather strict, criterion for usability is "Will it help on Monday morning?" This is, of course, short-sightedly restrictive. Next Monday morning is only one point on a teacher's trajectory toward expertise; the usability of knowledge provided in teacher education should not expire so quickly.

We argue that a crucial criterion for usability is contribution to the ongoing differentiation of teachers' understanding—a process that will occur through conversations with other teachers and with researchers throughout their teaching careers. Thus, one crucial role for technical knowledge about reading (and control over the associated technical vocabulary, that is, words like *phoneme, morpheme, orthography, onset, rime,* and so on) is to enable teachers to communicate with one another effectively about their professional experiences. Stigler and Hiebert (1999) note that one of the key outcomes of intensive lesson study among Japanese teachers is their increasing convergence on a shared language for talking about teaching and learning. Another source of such a convergence is learning how certain phenomena are talked about within their source disciplines. Anyone who has not studied reading development, educational linguistics, and literacy methods is likely to be genuinely confused about whether phonological awareness and phonics are the same thing, how phonological awareness relates to phonemic awareness, how cognates are different

from loan words, whether using loan words is the same as code-switching, and exactly what constitutes a writers' workshop. If teachers are confused about these questions, that constitutes an indictment of their preservice preparation, because such knowledge is crucial for professional communication (see Fillmore and Snow, 2002). Furthermore, if a group of teachers all use the same terms but each with a slightly idiosyncratic definition, then the possibilities for collaboration and mutual learning are invisibly undermined.

Quite abstruse knowledge is potentially usable—but making it usable is, at least for preservice and apprentice teachers, the role of the teacher educator. We cannot assume that teacher-education students will draw inferences about how and when their newly acquired knowledge should be used, any more than we can assume that fourth-graders will know without instruction how to draw inferences from text.

One way to make knowledge about language usable is to connect it directly to topics of burning interest to teachers: How do I plan instruction? How do I know in general what my students know and need to know? What do I do about the students who seem to be falling behind? The chapters that follow in this book attempt to present the answers to these questions in ways that reveal how knowledge from these disciplinary domains is crucial, and also ultimately highly usable. We have organized those chapters following the learning, enactment, assessment, and reflection cycle, and whenever possible, we describe the implications for the progressive differentiation of teacher knowledge.

Chapter Two focuses on the *learning* stage of the cycle—it defines the declarative knowledge about language, literacy, and their development that teachers need to learn. The topics dealt with in Chapter Two, phonology, orthography, morphology, syntax, semantics, pragmatics, etymology, and metacognition, are related explicitly to key elements of good reading instruction for teachers of students in kindergarten through secondary school. Chapter Two presents a description of reading development that abstracts from the complexities of individual and group differences. It is designed to make clear what usable knowledge about reading development would look like, not just for teachers in the primary grades for whom teaching reading is a well-defined task, but also for content-area teachers whose tasks include teaching students to read for learning in their subjects. Although there is considerable variability in the sophistication with which teachers might know the material presented in Chapter Two, an initial familiarity with it would constitute the stable, procedural knowledge any teacher of reading should have.

Chapter Three bridges from learning to *enactment,* showing declarative knowledge being enacted in a situated, procedural way in typical classrooms; we select kindergarten, fourth grade, and ninth grade to focus on, in order to be able to exemplify instructional approaches to the two major challenges children learning to read face: word reading and comprehension. Chapter Four ex-

tends the treatment of *enactment,* introducing the challenge of students who are not acquiring language or literacy skills in the typical, expected way; such students require of teachers expert, adaptive knowledge if they are to thrive, and a considerable research basis exists for recommending intervention with struggling readers, at least in the early elementary grades. While less definitive guidelines can be offered for intervention with middle- and secondary-school students, we summarize the scant available relevant literature as well.

Chapter Five focuses on *assessment,* and in particular on the array of tools teachers could use to chart the developmental progress of their students and to identify particular obstacles the students are facing. It outlines the usable knowledge base for engaging in instructional assessment. Assessment is a key move in the learning, enactment, assessment, and reflection cycle, and thus having knowledge about assessments is crucial for teachers at all points in their development.

Finally, Chapter Six addresses the context of teacher education—the conditions that need to be in place to ensure teachers the opportunities for *reflection* they need. In Chapter Six, we turn to the issue of how the vision for teacher education that is developed here might actually be implemented—what structures in universities, in teacher-education colleges, in school systems, and in professional societies would need to be changed. This is the chapter in which we sketch what is necessary to ensure that this book does more than gather dust on bookshelves next to its predecessors.

Of course, we must acknowledge that the state of knowledge about supporting literacy development, and thus about preparing teachers, is far from complete. In particular, there is need for more evidence about middle and secondary students' literacy learning. Research literature provides only limited answers to questions such as how to support the literacy development of English-language learners who arrive in late elementary or secondary grades, especially those with limited first-language literacy skills, or how best to deliver education to older students with special needs because of dyslexia, language disorders, or other learning disabilities. The limitations on research-based answers to such questions suggest the value of greater attention to the distilled wisdom of successful practitioners as at least a place to start in formulating directions for practice.

THE LIMITS OF TEACHER EDUCATION

Knowledge about language systems is not enough, of course, for a full understanding of reading. Reading with comprehension requires forming a mental representation of the message conveyed—an enormously complex process that is dependent on attentional processes, short- and long-term memory, prior knowledge, and the reader's preexisting theories or cognitive structures, as well as on the accurate conversion of orthographic to phonological representations.

If teachers do not know something of the cognitive bases for successful comprehension, they are unable to support continued growth in reading or use of reading in the content areas optimally. Issues of cognitive development, learning principles, and content-specific teaching knowledge are dealt with in *Preparing Teachers for a Changing World* (Darling-Hammond, Bransford, LePage, Hammerness, and Duffy, 2005).

Furthermore, successful reading instruction requires recruiting student motivation and interest; children learn to read, after all, in order to use that system to read about topics of interest to them, to learn about history and biology and literature, and to participate in a literate society. Unless teachers have some understanding of student motivation, wide knowledge of reading materials that might appeal to students with varying interests, and appreciation for the role of literacy in the lives of their students, they are likely to fall short in preparing their students.

Even expert-level knowledge of language and literacy as abstract systems will not help the teacher who has insufficient knowledge of developmentally appropriate practice for students across the K–12 age span, who do not understand curriculum and its uses, who lack classroom-management skills, and who cannot operate in the complex organizational structure of schools. These topics are addressed in *Preparing Teachers for a Changing World* and so we do not dwell on them here. But we cannot overemphasize their importance.

Improvements in teacher education and professional development hold great promise for improving the quality of teaching and learning in U.S. schools. We must be realistic, though, about the limits of schooling as an agent of reform. As Richard Rothstein points out in *Class and Schools: Using Social, Economic, and Educational Reform to Close the Black-White Achievement Gap* (2004), children arrive at school with vastly different stores of experience, knowledge, and expectations about learning. Schools can be asked to help all children optimize their potential, but they cannot credibly be asked to eliminate all differences among children of different social classes, with their immensely varying familial resources and drastically contrasting expectations for their futures. Eliminating class differences in academic outcomes will require economic and social as well as educational reform. A key aspect of the needed educational reform is to ensure that teachers are well prepared for their challenging tasks.