Chapter One

What Do Teachers Need to Know?

Specifying what teachers need to know and be able to do is not a simple task. As is true with all professions—including medicine, the law, and the clergy—there is no one right way to behave as a teacher. Some effective teachers are charismatic whereas others are more retiring. Some are emotional and some are reserved. Some appear stern while others appear more nurturing. There are many different ways that professionals can vary and still be highly effective. Within this variation, however, there are common practices that draw on shared understanding of how to foster student learning.

Our review of the research suggests that the common practices of effective teachers draw on three general areas of knowledge that beginning teachers must acquire in order to be successful with their students (Figure 1.1). These include

- Knowledge of *learners* and how they learn and develop within social contexts
- Understanding of the *subject matter* and skills to be taught in light of the social purposes of education
- Understanding of *teaching* in light of the content and learners to be taught, as informed by assessment and supported by a productive classroom environment

Teaching is complex and the various kinds of knowledge about teaching, learning, and subject matter are interdependent. As professionals, teachers make a commitment to learn what they need to know to help all students succeed. A professional teacher can no

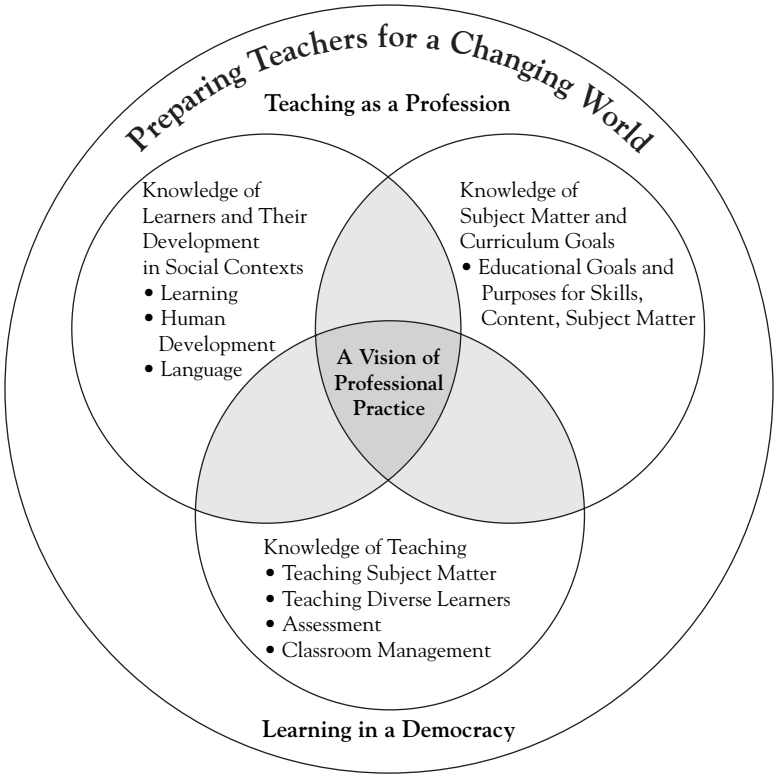

Figure 1.1. A Framework for Understanding Teaching and Learning.

longer naïvely assert, "I taught a great lesson, but nobody 'got it.'" Teaching, as John Dewey once remarked, is like selling commodities—they are not sold if nobody buys them. And a teacher has not taught if no one learns. The vision of professional teaching depicted in Figure 1.1 connects teaching with student learning and requires that teachers be able to point to evidence of that learning. It also requires that teachers be mindful of what it means to educate students within a democracy so that, as citizens, they can participate fully in political, civic, and economic life.

We use the framework in Figure 1.1 to describe the knowledge beginning teachers need to acquire in order to be successful with their students. We base these recommendations on research about

how people learn and what effective teachers understand and do to help them learn. We describe what beginning teachers need to know about learning, human development, language, curriculum, teaching subject matter, teaching diverse learners, assessment, and classroom management.

Knowledge of Learners and Their Development

The first circle in Figure 1.1 addresses the knowledge and skills teachers must have about learners and their learning, development, and language acquisition.

Learning

First and foremost, beginning teachers should understand how children learn. A seminal work for understanding this vast body of research is the National Academy of Sciences report *How People Learn: Brain, Mind, Experiences, and School*.[1] It looks at how children learn from the vantage point of

- The *learner* and his or her strengths, interests, and preconceptions
- The *knowledge*, skills, and attitudes we want children to acquire and how they may be organized so that students can use and transfer what they've learned
- The *assessment* of learning that reveals learning, makes students' thinking visible, and, through feedback, guides further learning
- The *community* within which learning occurs, both within and outside the classroom

What does this mean for what beginning teachers must know? Clearly, teachers must learn to plan for and integrate all four components of this learning framework. Understanding the *learner and the learning process* includes understanding how children develop and

learn, as well as how to build on their experiences and cultural backgrounds in making connections to the material. Beginning teachers need to understand

- The constructive *nature of knowing*—the fact that we all actively attempt to interpret our world based on our existing skills, knowledge, and developmental levels. This means that teachers need to understand what students already know and believe and be able to build bridges between students' prior experience and new knowledge. This includes anticipating student misunderstandings in particular areas so that they can be addressed.
- *Cognitive processing*—how people attend to, perceive, and process information, retain it in short- and long-term memory, and retrieve it. This includes understanding the importance of organizing information so that it can be connected to other ideas, incorporated into a schema for learning new information, and retrieved when needed.
- *Metacognition*—how people learn to monitor and regulate their own learning and thinking. This includes knowing how to teach students to think about what they understand, what they need to learn, and what strategies they can use to acquire the information they need.
- *Motivation*—what encourages students to become and remain engaged with their learning. This includes knowing what kinds of tasks, supports, and feedback encourage students to put forth effort and strive to improve.

Furthermore, if they are to support learning that prepares students for life in a complex world, teachers have to consider the *knowledge* they are trying to transmit. In addition to decisions about what is taught, which may be guided by national, state, and local standards, teachers must consider how specific topics and ideas may best be taught. This requires knowledge of the structure of the discipline—how it is organized and what its central concepts are—as well as how to represent these ideas so they can be understood by learners at different ages and stages.

Teachers need to know how to help learners develop a mental map of the domain they are studying—whether it is World War I, the concept of ratio, or how to write an essay—so they can see how ideas are related to one another. Teachers also need to be able to choose vivid examples and representations of the ideas they are teaching that connect to what students already know. Often these examples need to confront directly the misconceptions the students already hold based on their prior experiences. And teachers need to know how to "scaffold" learning by providing just enough of the right kind of assistance at each step to move students forward in their understanding and performance.

Beginning teachers must be able to connect their understanding of *knowledge* with their understanding of *learners* by being *assessment-centered*. Assessment allows teachers to figure out how to pursue their curriculum goals in ways that will work for the students they teach. Assessments, and the feedback they can provide, are actually another source of learning, not just an evaluation of it. Teachers need to know how to construct, select, and use formal and informal assessment tools to show them *how* students are learning and *what* they know, so that they can give constructive feedback that guides further learning and informs instruction.

Finally, learning is influenced by the way people interact in the classroom as well as the home and broader *community*. Teachers need to know how to create information-rich classrooms and social networks where students can learn from each other and the materials in the environment. They need to build upon the "funds of knowledge" that exist in their students' communities and link their students' prior experiences outside of school to those within the classroom.

Human Development

Understanding children, how they develop, and how they learn is critical for effective instruction. Teachers' knowledge of development enables them to be effective in managing the classroom, selecting appropriate tasks, guiding the learning process, and maintaining

children's motivation to learn. Without this kind of knowledge, teachers often choose inappropriate learning tasks that bore or frustrate students or that fail to support learning. Developmentally inappropriate tasks not only breed academic failure for students, they also undermine motivation and encourage disruptive behavior.

In order to understand and support students' learning, a teacher must be able to take a "developmental perspective." This includes an understanding that development occurs along a number of different pathways—physical, social, emotional, cognitive, and linguistic, among others. Teachers need to know how to support development along all of the pathways to move children forward in their learning, and they need to understand how these dimensions interact with each other. Teachers particularly need to understand that various stages of development do not necessarily occur at the same age for each child and that development in different dimensions does not necessarily occur evenly within the same child. Teachers with such a perspective understand that students will have different developmental needs and will be able to figure out how to help children learn the right things at the right times in the right ways to maximize their progress.

In order to plan instruction, teachers need to understand general developmental progressions, as well as individual differences in development, so that they are able to determine when children are prepared to learn specific things in particular ways and how to support them as they take on new tasks. In addition to understanding the stages of development—from concrete to more abstract thinking, for example—teachers need to understand the components of tasks they assign and what those tasks require so that they can choose tasks that students are ready to tackle and can provide instruction that addresses what students need to know to succeed.

To do this, teachers must be able to observe students carefully to evaluate not only what they know but also how they learn and perform. Teachers who are able to evaluate a child's developmental level create tasks that address the things the child is ready to learn next, and provide the necessary supports for learning that help children

confront new challenges with confidence and growing competence. With that knowledge teachers can help young children continue to feel successful and inspired to learn; without it, they can stymie children's immediate learning and endanger their future success.

Teachers also need to understand how instruction can support development. The older belief that development proceeds at a strict pace that determines children's "readiness" for learning has been replaced with an understanding that learning can affect development, and teachers can construct experiences that advance development. For example, by providing a language-rich classroom with lots of opportunities for speaking, listening, and seeing and using print, students who have had less experience with different kinds of language will develop linguistically and become more ready to learn specific reading skills. With the right support, students can successfully learn to do things that are one level more advanced than what they already understand.

The fact that learning affects development (and vice versa), and that both learning and development are deeply embedded in cultural contexts, means that teachers must understand and appreciate the variety of ways children's experiences can differ and be able to see and build upon personal experiences and cultural strengths if they are to help all students succeed. Understanding children's cultural and home experiences also reduces the opportunities for miscommunication and unnecessary misunderstandings.

Finally, beginning teachers need to understand how to help students build healthy identities as learners and contributors, as well as individuals with solid values and character, since these identities determine how students behave and how they invest their time and effort. When children see themselves as able to succeed if they put forth effort, they are more likely to work hard and help themselves and others. Supporting this kind of development is much easier when all of the adults in the school and home are working together to create a network of common values and support. Thus, teachers should know how to work with parents and colleagues to create common ground for supporting children's development and learning together.

Language

All teachers, regardless of the language backgrounds of their students, are directly and intimately involved with language. No matter what subjects they teach, and whether they work with kindergartners, middle school students, or high school students, teachers use language in many ways in all of their teaching activities. Teachers use language to get students' attention, present information, emphasize particular points, provoke discussion, praise, push for better answers, explain, and sometimes reprimand. For most teachers, however, language use is almost completely unconscious. Few notice the choices that they make in using particular strategies to convey tone or meaning, or recall how they acquired these strategies. Although they are proficient in the use of language, they are unlikely to know how to support language learning without explicit training in how students acquire language skills.

There are a number of big ideas that beginning teachers must understand about language and language differences:

- Speakers of English, like speakers of every other language, use many different varieties or dialects, depending on their regional and class origins.
- These varieties of English, which vary in pronunciation, vocabulary, and even grammatical structures, are all complex and contain sophisticated rules. Depending on the variety spoken, "ain't ain't no error." Instead its use represents the learning of complex rules by its speakers. Teachers will want to help students learn to speak and write standard English in ways that are accepted by the general society. At the same time, it is important for teachers to realize that use of terms like "ain't" signals a response to community conventions rather than a lack of intelligence, and is the result of sophisticated implicit learning rather than the result of some failure to learn.
- Most children come to school as competent speakers of the language spoken in their homes and communities even if that language is not a "standard" variant of English.

- Like speakers of all other languages, speakers of any variant of English—standard or otherwise—use many different registers and styles in their everyday lives. Whatever variety of English they use, children speak differently when addressing their intimate friends than when addressing authority figures such as a teacher or a religious leader. They use language differently at home, in school, on the playground, and elsewhere. Teachers who understand this can help students expand their repertoire to include the styles of various academic conventions, such as a written paper or oral presentation, without asking students to abandon styles appropriate for other contexts, such as seeking advice from a teacher or socializing with a friend.
- Only children whose families use language in ways that are very similar to the ways it is used in school will have acquired the rules for using school-like language. Children who have not been exposed to such language use may initially have difficulty with the many different meanings that questions and other communications have in school settings and will have to be taught these new forms, as well as new vocabulary.

As a foundation for helping students develop language, teachers need to understand the building blocks of language, including the sound system (phonology), the structure of words (morphology), and the structure of sentences (syntax). They need to understand first and second language acquisition (both at home and at school), language variation, and the relationship between language and literacy and to study these topics in relation to classroom practice.

For most children, enhancing language development will involve expanding their linguistic repertoires so that they learn how students are expected to speak and write in school in order to discuss ideas, understand texts, and demonstrate their learning in individual, small group, and large group situations. In the classroom, this means that students who come from language and literacy backgrounds different from those dominant in school will need additional opportunities for practice and feedback in using language for academic purposes in ways consistent with the expectations of schools. For both first- and

second-language speakers, teachers need to know how to provide explicit modeling and instruction in how to ask and answer certain kinds of questions, raise points, seek information and clarification, and use technical language in a discipline.

For non-native English speakers, beginning teachers need to understand the importance of providing children opportunities to interact frequently with fluent speakers of English in addition to providing direct instruction in English. They should know how to carry out formal and informal assessments of their English language learners (ELL) to see whether they can follow a class explanation, understand the instructions on a work sheet, read assignments in the time allotted, and the like. Beginning teachers need to know how to evaluate the accessibility of specific lessons for different ELL students (as well as for native English-speaking students) and design ways to provide greater access to the lesson without compromising academic content and language. They need to know how, for example, to appropriately choose and explicitly teach vocabulary, use carefully selected texts, and incorporate graphic representations of ideas. They also need to know how to assess student knowledge of content in ways that do not penalize English language learners for their limitations in oral and written English production. And they need to know how to provide many models of both written and spoken language in the discipline for students to emulate. As they explain how to write a lab report, model a good classroom presentation, or give instruction in reading word problems, teachers will foster the development of academic language for all of the students in their classrooms.

Knowledge of Subject Matter and Curriculum Goals

In addition to understanding learners, teachers must know the subject matter they will teach and understand how to organize curriculum in light of both students' needs and the schools' learning objectives. A "curricular vision"—one that also takes into account the social

purposes of education in a democracy—is necessary to guide decisions about what to teach and why. It is what enables teachers to select, adapt, and design materials and lessons so that they can accomplish their goals.

Within the classroom, beginning teachers must be able to plan and enact a set of learning opportunities that provide access to key concepts and skills for all students and help them develop along the various developmental pathways discussed earlier (cognitive, social, linguistic, and so on). The capacity to plan instruction so that it meets the needs of students and the demands of content—and therefore is purposeful and "adds up" to important, well-developed abilities for students—is not something that most people know how to do intuitively or that they learn from unguided classroom experience. Even when teachers are provided with texts and other materials for their classrooms, they must still figure out how to use these to meet goals and standards, given the particular needs and prior learning experiences of their students and the resources and demands of their communities. Based on the learning needs of their students, teachers must make a wide variety of curriculum decisions, ranging from the evaluation and selection of materials to the design and sequencing of tasks, assignments, and activities to the assessment of learning to guide further teaching.

These demands on teachers have grown with the advent of standards-based reforms that presume that teachers will use data about student learning to help students acquire skills they have missed or are struggling to learn. To guide curriculum decisions, beginning teachers must know about national, state, and local standards for student learning. In order to interpret and use these standards, teachers need to be able to identify central concepts that are essential building blocks for understanding, evaluate what their students know, and organize their instruction around critical topics in ways that are appropriate for the particular students they teach.

Beginning teachers' initial knowledge of curriculum also should include an understanding of how to develop and carry out coherent

curricular plans in which goals are clear and well-reflected in activities and assessments, and learning experiences are well-designed to achieve the goals. They should know how to make sound curricular decisions, including selecting appropriate materials and choosing teaching strategies that will help students understand key ideas. In today's world, teachers must be able to incorporate the use of technology to help their students access information and resources, develop skills, and represent ideas.

Teachers also need to be able to balance the many curriculum goals that always compete for time and attention so that they are advancing students' in-depth understanding of critical concepts, their ability to make connections among ideas, and their social skills for working with others and contributing to society. And beginning teachers must be aware of age-old curriculum concerns that require continual attention: balancing breadth and depth, incorporating both cognitive and affective goals for learning, avoiding fragmentation, and striving for both relevance and rigor.

As they do this balancing, teachers should be aware of the various purposes of schools, ranging from building academic skills and preparing students vocationally to developing the civic responsibility required of citizens in a democracy and developing the personal talents of individuals. They should also be aware of their professional responsibilities to children and families, including policies regarding curriculum, teaching, and assessment; student rights to an education (for special needs students and language minority students, as well as others); child protection and welfare; and access to particular programs or services for students.

In sum, beginning teachers need to have a sense of where they are going, why they want students to go there, and how they and their students are going to get there. They must be able to create a coherent curriculum that is responsive to the needs of students and construct a classroom community in which the "hidden curriculum" fosters respectful relationships and equitable opportunities to learn.

Knowledge of Teaching

The third circle in Figure 1.1 involves the skillful teaching that enables learners to access the curriculum. In addition to knowledge of subject matter, at least four areas of knowledge and skill are essential for this process: the development of pedagogical content knowledge specific to the subject area, knowledge of how to teach diverse learners, knowledge of assessment, and an understanding of how to manage classroom activities so that students can work purposefully and productively. We turn to each of these below.

Teaching Subject Matter

Much of teaching relies upon anticipating and preparing for student understanding ahead of time. Being prepared to teach subject matter requires deep knowledge of the content itself, the process for learning this content, and the nature of student thinking, reasoning, understanding, and performance within a subject area. These are the foundations of pedagogical content knowledge: the particular knowledge teachers must have to make content accessible to students.

Teachers need flexible understanding of subject matter; they need to know how to solve the problems they pose to students and to know that there are multiple approaches to solving many problems. But such competence is not enough, teachers also must be able to anticipate and respond to typical student patterns of understanding and misunderstanding within a content area. They must know how to anticipate and diagnose such misunderstandings and how to deal with them when they arise. (For an example see Exhibit 1.1.) They should be able to create multiple examples and representations of key ideas that make the content accessible to a wide range of learners. These representations need to connect new ideas that are unfamiliar to things that students already know and have experienced.

Teachers need to understand the processes of learning within a specific field; for example, how do people generally acquire the

Exhibit 1.1. An Example of Pedagogical Content Knowledge.

Imagine you are a second grade teacher working with a small group of children reading a short fairy tale. Concerned about Juan's reading, you take him aside and ask him to read the following short section of the fairy tale aloud. "Once upon a time, an old man and his wife lived in a little house in the woods. They were very poor. The man was going to cut wood for the fire. His wife gave him a little rice cake to take with him. It was the last bit of food they had."

Juan reads: "Once upon a time, an ol man and his wif lived in a little hus in the wuds. They were very poor. the man was going to cut wud for the fir. His wif gave him a little ras cak to tak with him. It was the last bit of f. f. f. food they had."

As Juan's teacher, which two of the following would be most important for you to focus on during instruction?

- Work on high-frequency sight words
- Practice with reading for meaning
- Instruction on CVCe patterns
- Work on consonant sounds
- Use of background knowledge

Based on this sample of Juan's reading, a skilled teacher would observe that this brief segment of text is at Juan's frustration level for reading, and is therefore inappropriate for independent reading. The number and type of errors Juan makes support the need to provide him with easier text. Although it is difficult to get a firm understanding of Juan's strengths and needs from a text at his frustration level, a skilled teacher could learn that Juan's performance indicates that he is not reading for meaning. In the very first sentence, he misreads several words (wife, woods, house) and substitutes nonsense words for them (wif, hus). This suggests that he not

only has difficulty decoding these words but that he does not recognize that his guesses do not make sense in the sentence. It does not appear that Juan self-monitors his reading or uses the context to re-read for meaning.

Although it seems as if Juan has not yet learned that reading should make sense, this conclusion is complicated by the fact that Juan is an English language learner. From the information provided, we do not know his level of English proficiency and we have no way of knowing if the words he misreads (wife, house, fire, etc.) are a part of his English listening or speaking vocabulary. It is also complicated by the fact that the passage is at his frustration level, where he misreads many words, making it more difficult to for him to use context to aid in self-monitoring, an issue the teacher would want to explore further.

A skilled teacher would also notice that many of the words that Juan misreads are CVCe words—words that follow the pattern of consonant, vowel, consonant, followed by a silent e. The CVCe generalization, familiar to most experienced readers of English, is that words of this pattern (wife, bite, kite, mate, etc.) generally have a long vowel sound; without the "e" at the end, the vowel becomes short (bit, kit, mat, etc.). Juan pronounces the consonant sounds correctly, but mispronounces the medial vowels in these words as short vowel sounds. He has not yet learned the orthographic pattern that signals a long vowel sound. A knowledgeable teacher would target this for instruction to help Juan improve his ability to decode text and then begin to read for meaning.

Source: This example is drawn from Sheila Valencia, University of Washington, and is included in Pamela Grossman and Alan Schoenfeld, "Teaching Subject Matter," in *Preparing Teachers for a Changing World: What Teachers Should Learn and Be Able to Do*. San Francisco: Jossey-Bass, 2005.

critical concepts, thinking skills, and performance abilities that are needed to become a proficient mathematician, reader, writer, scientist, historian, artist, musician, or language speaker? They also need to understand the structure of the discipline: what the major ideas and modes of inquiry are that distinguish the discipline, for example, experimentation in science, perspective and evidence in history and social science, meaning and expression in the language arts, logic and problem solving in mathematics, and so on.

Beginning teachers should be able to answer the following questions about the teaching of their subject area(s):

- *How do we define the subject matter?* What are the central concepts and processes involved in knowing the subject matter? Are there competing definitions of the subject matter? How do national and state standards or frameworks define the content and what it means to know the content?
- *What are the different purposes for teaching the subject matter?* Why is the subject important for students to study? What aspects of the subject are most important? Are there different purposes for teaching the subject matter depending upon the age of students?
- *What does understanding or strong performance look like with regard to this subject matter?* What are the different aspects of understanding and performance? What are students likely to understand about the subject matter at different developmental stages? How do student understanding and proficiency develop, and how can instruction support this development?
- *What are the primary curricula available to teach the subject matter?* What definitions of the subject are embedded within the curriculum materials? How are curricula aligned with national and state standards? How are they articulated across grade levels? How can teachers use curriculum materials effectively to support student learning?
- *How can teachers assess student understanding and performance within a subject matter domain?* What tools are most useful for assessing student competence? How do teachers use the results of these assessments to inform instruction?

- *What are the practices that characterize the teaching of particular content?* What practices and approaches have been shown to be effective in promoting student learning? Are there practices that are particularly effective with specific groups of learners? What representations, examples, and analogies are particularly useful in helping students grasp particular concepts or ideas?

Teaching Diverse Learners

In today's schools, teachers must be prepared to teach a diverse student population. Students of color now comprise 40 percent of elementary and secondary students, and more than 10 percent of students are recent immigrants who are new English language learners. In addition to a wide range of language and cultural backgrounds, diversity in the range of academic abilities within classrooms has also grown as more students with exceptional needs are mainstreamed. Of the 13 percent of students identified for special education, half spend most of their time in general education classrooms. Beginning teachers must be prepared to take into account the different experiences and academic needs of a wide range of students as they plan and teach.

To teach all children well, teachers must know how to tailor their curriculum and instruction so that their students will be engaged in meaningful work. A basic principle of learning is that people need to begin with what they already know and have experienced and connect it to new information or ideas they are trying to learn. Thus, beginning teachers need to know how to learn about their students' experiences in order to construct curriculum and teaching that build on these experiences and students' prior knowledge.

Beginning teachers should be prepared to find out more about communities, families, and individual students. As teachers become aware of family and community values, norms, and experiences, they can help mediate the "boundary crossing" that many students must manage between home and school, and they can better engage their students' parents in the work of the school.

Teachers should know how to examine their own cultural assumptions to understand how these shape their starting points for practice, while also knowing how to uncover students' strengths, interests, and ways of communicating and behaving. To instruct students who learn in different ways, teachers need a repertoire of teaching strategies that respond to different learning styles and approaches. They need to diagnose *how* students learn as well as what they know by using a wide range of formal and informal assessment tools that are appropriate for students of different cultural and language backgrounds. They should know as well about curriculum content and materials that are inclusive of the contributions and perspectives of different groups.

In addition to the wide range of languages and cultures in most classrooms, another kind of diversity is the range of learning differences among students, including special education needs increasingly common in most classrooms. In teaching students with exceptional needs, teachers must understand differences in how people learn and process information, including the nature of common learning disabilities, such as dyslexia, developmental delays, autism, and attention deficit disorder. Teachers should be aware that many conditions can be very mild (hardly recognizable) to very severe. For common disabilities (for example, auditory or visual processing problems), teachers should have a basic repertoire of assessments, strategies, and adaptations that can help students gain access to the material they are teaching. At a minimum, teachers should understand how they can make appropriate adaptations for special needs students around time, the size or difficulty of tasks, the kinds of assistance offered (including technological supports), the way input is offered (auditory, visual, and so forth), and the kind of output required (how students demonstrate their learning). For the many students who have reading disabilities, teachers should have a working knowledge of strategies for supporting basic instruction and routine accommodations.

In addition, beginning teachers should have some understanding of the special education eligibility and placement process and how to work with other professionals and parents within these processes.

They need to know where to find additional information about specific diagnoses, disabilities, and services. And beginning teachers should know how to contribute to and implement individualized education plans (IEPs) for students in their classrooms. In short, teachers should be able to teach responsively, based on close study of their students' learning and an understanding of how to support learning differences.

Assessing Student Learning

If the central task of teaching is enabling learners with very different experiences, learning styles, and starting points to acquire common, high-level knowledge and skills, teachers must have many tools for tapping into what students think and be able to adapt instruction to their needs. Assessment of student learning is an integral part of the learning process. A generation ago, it was considered sufficient if teachers knew how to give tests that matched learning objectives. Today we know that assessment used to discover what students understand and how they are reasoning about a subject area can be a powerful tool in targeting instruction so as to move learning forward. Teaching, learning, and assessment must be understood as interactive and cyclical; for example, assessments of student learning should help improve teaching and subsequent learning. This is very different from thinking of these three as discrete, linear activities.

Beginning teachers must be knowledgeable about formative assessment that is carried out *during* the instructional process for the purpose of improving teaching or learning. They must be skillful in using various assessment strategies and tools such as observation, student conferences and interviews, written work, and discussions, as well as responses on tests and performance tasks. They must be knowledgeable about formative assessment that is carried out during the instructional process for the purpose of improving teaching or learning. Such assessments should be infused throughout the instructional process to help make students' thinking visible as they progress through a course of study, enable feedback about their work that guides

revisions in their thinking and performance, and plan teaching so that it is responsive to what students need to know and how they learn.

Knowing how to give feedback that is concrete and productive is a key skill for teachers, along with knowing how to help students learn to self-assess. Teachers must not merely give feedback about whether answers are right or wrong; they must link feedback explicitly to clear performance standards and provide students with strategies for improvement and opportunities for revision. Teachers should understand the importance of providing feedback throughout the learning process, rather than only at the end, as well as the importance of offering positive feedback that identifies strengths along with constructive feedback that focuses on a limited number of key points that can be addressed in revisions.

Most important, teachers must be able to use insights from assessment to plan and revise instruction, using assessment information to inform moment-to-moment decisions in the classroom (for example, whether students need more explanation of a new concept), short-term planning (for example, the design of upcoming lessons), and long-term planning (for example, the development of larger units of study). In order to do this well, teachers must be able to assess students' prior knowledge, so that they can determine where to begin instruction, and they should have a working idea of typical learning progressions within subject matter domains, so that they know what they are helping students toward and how to back up if students do not immediately understand. At the individual and group level, teachers should be able to use data from different kinds of assessments to evaluate patterns of student strengths and weaknesses so that they can build on student strengths and target instruction where it is needed.

In planning assessment, teachers must know how to choose or develop assignments that represent their goals for learning (for example, reading books and newspapers, conducting experiments, developing explanations), and they need to know how to align standards, assessments, and learning experiences so that students will be able to succeed on the assignments as a result of the activities they have undertaken.

Beginning teachers should know how to use data systematically to make judgments about the specific aspects of instructional strategies that may be hindering learning. They should be able to assess their own instruction and assessment and determine, for example, whether tasks they have chosen are appropriate given the instruction students have had, are appropriate for second-language learners or students with special needs, and whether they generate good information for both student and teacher learning.

Teachers also have responsibilities for giving grades and reporting to parents about student progress. They need to know how to construct appropriate and informative summative assessments that are carried out primarily for the purpose of evaluating knowledge, giving grades, or certifying student proficiency. These assessments should afford students opportunities to demonstrate higher-level skills and provide multiple ways to demonstrate their proficiency, as well as evaluate students in relation to performance expectations. Teachers should understand principles of grading practices, including the kinds of information that grades should convey and the benefits and limitations of different kinds of grading systems.

Beginning teachers should understand the kinds of standardized tests that are used in national, state, and district-level assessments. This includes an understanding of what different tests measure, what can and cannot be inferred about student understanding from scores on a given test, and how to interpret the scores for improving instruction and informing parents about their children's achievements. Teachers also should know about the beneficial and harmful effects of different uses of high-stakes assessments. With this knowledge, teachers can design their curriculum and instruction to maximize the benefits of the information that tests provide and minimize potential harmful effects of high-stakes tests that can occur if the curriculum is narrowed or data are used to make inappropriate placement decisions.

Managing the Classroom

Many beginning teachers, especially those who are underprepared, focus much of their concern on classroom management, especially as

it pertains to student discipline. Organizing a classroom for learning is extremely important to safeguard valuable time and to create a positive environment for teaching and learning. However, effective classroom management extends far beyond rules for classroom conduct and procedures to deal with misbehavior. Teachers who know how to structure activities and interactions so that they are orderly, purposeful, and based on common understandings of what to do and how to behave give students more opportunity to succeed because they understand what is expected of them. Given a strong curriculum, well-developed sense of community, and clear routines that have been established, teachers will encounter less problematic behavior by students.

To establish a well-functioning classroom in which learning occurs, beginning teachers first need to know how to create meaningful instruction that is motivating and engaging. The most fundamental elements in supporting student learning and engagement are choosing tasks that are developmentally appropriate and intrinsically interesting and providing supports that help students succeed.

Second, beginning teachers must know how to develop a learning environment within the classroom that supports a sense of belonging and commitment to the welfare of the group, as well as a sense of responsibility to cooperate with and help one another academically and socially. In order to develop such a community, teachers need to know how to help students learn to interact with one another respectfully (something that many students need to be taught), how to design cooperative learning activities in which focused learning occurs for all of the students, and how to work with parents to extend a working partnership into the home.

Third, beginning teachers must know how to organize the classroom to provide an orderly, purposeful environment that optimizes learning time and minimizes distractions. This includes knowing how to maintain the flow of activities; being alert to student responses and adapting instruction as needed to maintain attention, clear up misunderstandings, or attend to problems; and working with students to establish well-understood norms of behavior. It also includes knowing

how to set up productive routines and procedures with respect to the physical setting of the room, transitions into and out of the room, roles and expectations during group work and independent work, general tasks such as distributing materials, tasks specific to particular classroom routines such as taking attendance or moving student desks, and engagement in specific instructional activities such as how to participate in discussions.

Fourth, beginning teachers should know how to repair and restore student behavior in the relatively rare circumstances in which students are disruptive or disrespectful. When a student behaves in ways that are counterproductive to the classroom goals and norms, teachers should know that there are many strategies to choose from and should be able to evaluate the student's particular learning situation and needs, the history of the student's behaviors, the context of the class, and the severity of the problem in light of classroom and school policy. Beginning teachers should know how to use unobtrusive methods of regaining students' attention in cases of minor disruption, and how to use conflict resolution skills in cases of clashes between students. They should know how to evaluate specific classroom management programs and how to explicitly model and teach desired behavior, including reasoning skills that help students begin to evaluate their own behavior, modify their actions, and find solutions to problems so that long-term improvements in interactions occur.

In Sum . . .

There is much that beginning teachers need to know before they take on responsibility for a classroom. In particular, they must take responsibility for teaching all children. In order to fulfill this enormous responsibility, they must

- Know their subject well and know how to teach it to students
- Understand how children learn and develop
- Be able to observe, monitor, and assess children to gain accurate feedback about their learning and development

- Know themselves—understand their own language and culture and know how to learn about other cultures with different language patterns and ways of knowing
- Be able to develop a curriculum and learning activities that connect what they know about their students to what the students need to learn
- Know how to teach specific subject matter in ways that are accessible, anticipating and addressing student conceptions and misconceptions
- Know how to develop and use assessments that measure learning standards and how to use the results to plan teaching that will address student learning needs
- Know how to use systematic inquiry, including how to observe an individual child in interaction with different tasks and other students to diagnose his or her needs
- Be able to evaluate why children may be responding or behaving in particular ways given the context of the classroom, the individual nature of the learning challenges, and the child's life outside school
- Be able to develop interventions, track changes, and revise their instructional strategies as necessary

What Do Teachers Need to Know? Quick Summary

- Teachers need to know how students *learn and develop* and how they *acquire and use language*.
- Teachers need to understand their *subject matter* and the *purposes of curriculum*.
- Teachers need to know and understand *teaching:* how to *teach subject matter* so it can be understood by diverse learners, how to *assess learning,* and how to *manage a classroom effectively*.