How Teachers Teach: Mapping the Terrain of Practice

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Authors' Note

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Introduction

What follows is a framework that sets forth the main competencies involved in responsible, responsive, and effective teaching. Components of competent teaching are set forth at a relatively high level, requiring further detail to demonstrate how they unfold in particular situations as may be influenced by such factors as the subject matter, characteristics of students in the classroom, and others. While these competencies may be taught and learned, their enactment will be influenced not only by what teachers know and know how to do, but also by the conditions of teachers' work. Competence then is not simply what teachers bring to the contexts in which they work but also what those contexts support or limit. In action, competence is always shaped by persons-in-situations (Kennedy, 2010). Also, while competence may be assessed for various purposes, this account is not limited to what may be measured. The intent here is to express the full range of teaching competence to serve multiple purposes as set forth below.

Two important questions about competencies concern what is necessary for safe and responsible practice upon entry into the profession and how competencies develop thereafter—toward expert or master practice. Establishing a standard for entry to teaching is a public and professional judgment informed with reference to a competency framework. The behaviors, knowledge, skills, dispositions, and levels of proficiency novices must demonstrate before being allowed to begin teaching is a matter for standard-setting that can be gauged in relation to the full set of competencies claimed to underlie effective practice.

How competence develops in teaching is an empirical question that requires further study. The most prevalent approach uses the research on expert-novice comparisons as the basis for insight, proposing the *adaptive expert* as the long-term goal (see, e.g., Berliner, 1992, 2001; Ericsson, 1996, 2005, 2007, 2008; Hatano & Inagaki, 1986; Snow, Griffin, & Burns, 2005). Along with other kinds of experts, teachers are thought to develop fluid and automatic routines for aspects of their practice and to acquire problem-finding and solving capabilities that extend their knowledge and improve how they adapt their practice to their students. The account presented here does not propose any developmental sequence or progression through which expertise in teaching emerges and accumulates, but rather focuses on identifying the core competencies of responsible practice for teachers in regular education settings. Making decisions about entry, early career, or expert teaching involves professional judgment, and research on how teachers develop competence over time is an important subject for future inquiry (see Reynolds, 1992, for one early effort to distinguish what beginning teachers must know and know how to do).

The report offered here—conceived as a map of competencies in teaching—represents an interpretive synthesis by the authors of main and contemporary currents in the research on

teaching and learning, supplemented with attention to literature on best practices, documents authored by professional organizations setting forth standards for teaching and learning, prominent measures and assessments of teaching such as observation instruments, and expert opinion provided by reviewers of this report (as listed in the appendix).

The claims set forth in this report draw to the extent available on results from well conducted studies of teaching, but of necessity extend beyond such warrants to claims that rest on partial or limited support in the research, and to extrapolations from research that rely on our own professional judgments and those of other experts and professional organizations. We offer this disclaimer as an invitation to our readers to judge for themselves, to improve upon this effort, and to continue the conversation about competence in teaching. We are mindful that the research journals brim with new studies, new findings, and challenges to old wisdom that continuously refine and even redefine our ideas about teaching. Practitioners, too, are engaged in creating a wisdom of practice that also serves as an important source of evidence to consult in determining what constitutes competence in teaching.

This report then is not the end but the beginning of efforts at ETS to make a contribution to the ongoing discussion about good teaching and it is in this spirit that we propose what follows.

A Guide to This Report

We begin with a rationale for this framework and its utility. Next, we provide a set of orienting assumptions that underlie what follows. These assumptions deal, in turn, with (a) the conception of competence upon which claims are based, including warrants for such claims together with limitations that must be kept in mind when reading what follows; (b) the purposes of education as these ground claims for competence in teaching; (c) principles of learning as a basis for claims about teaching; and (d) the nature of teaching that underlie this framework.

We conceive teaching competence as encompassing two broad domains, one oriented to instruction and the other to the broader set of professional role responsibilities that teachers undertake. In this conception we further decompose these domains into a set of nine subdomains or components, which in turn are further decomposed into 34 yet finer grained competencies. Then we identify specific practices within each competency. Table 1 presents our rendering, but we introduce each of these elements in the text that follows.

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Table 1. Domains of Teaching

Domain I: Instruction	Domain II: Professional Role Responsibilities
Preparing and planning for high quality instruction Drawing on students' cultural, family, intellectual, and personal experiences and resources Promoting community participation as opportunity to explore core values Setting long- and short-range learning goals and objectives Mastering lesson content for instructional purposes Selecting and adapting resources for use in instruction Selecting/designing instructional tasks, activity structures, and formats Planning assessments	Collaborating with other professionals Using professional networks Communicating professionally, both in person and via technology Collaborating in professional learning communities and on teams Exercising leadership, both formally and informally
Attending to relational aspects of instruction Developing caring and respectful relationships with individual students Attending to and promoting student social and emotional needs and learning Building positive classroom climate	Working with families and communities Fostering two-way, respectful communication with parents and guardians Using family- and community-related information as a resource for learning
Establishing and maintaining the social and academic culture Implementing organizational routines, norms, strategies, and procedures to support a learning environment Managing the physical and material environment Managing instructional groupings Using time productively	Fulfilling ethical responsibilities Enacting the basic moral principles and duties associated with the role of teacher and exercising diligence and prudence in observing these duties Responding to ethical dilemmas with sound reasoning and actions Detecting and correcting biases of various kinds via reflection and feedback Advocating appropriately for students
Interactive teaching Attending to instructional purposes Enacting instructional tasks and activities Engaging students with subject matter Orchestrating productive discourses Providing strategy instruction Assessing and responding to student learning during instruction	Meeting legal responsibilities Complying with all relevant laws and regulations Creating and maintaining accurate records of student progress and related matters
Engaging in instructional improvement Improving instructional routines Engaging in deliberate practice	

Rationale

This analysis of teaching serves a number of purposes. First, it is intended to provide the foundation for the design of assessments for professional qualifications. In all professions, competencies are developed and assessed in a variety of ways. These include formal and informal assessments woven into training programs and into the standards for such programs; licensure examinations, continuing education, specialty education, and recertification requirements; hiring procedures for work in particular settings; and regular evaluations of practice coupled with professional development. A common account of competencies then becomes one resource for evaluating the assessments in use to determine what might be overlooked, underrepresented, or misjudged. Such a framework also provides one basis for judging the content validity of assessments for teaching. Ideally, a common framework or system supplies coherence and continuity to this range of experiences and ongoing assessments but in teaching, current arrangements fall well short of this aspiration.

Second, such a mapping informs the broad public about the main claims to competence in the teaching profession. It is intended to enter into the public discourse about what responsible and effective teaching entails, particularly as anchored in expectations about the purposes of education and the teacher's role in fulfilling those purposes.

Third, this report is intended to inform programs of teacher preparation and professional development. The focus is on *practices* (a point we return to later), which is intended to signal attention to what effective teachers learn how to *do* in the course of teaching, based on knowledge used in practice.

Fourth, the framework provides one basis for regulations or criteria developed for preparation program approval. Program accreditation then warrants what graduates know and know how to do upon entry to practice. It is the combination of warrants provided by programs of preparation together with those supplied in licensure that grants permission to teach.

Finally, such a framework provides guidance for those learning to teach, concerning those practices they develop and master.

Clearly, in serving these purposes, professional judgment will be required to determine what practices of teaching must be warranted upon entry and then how teaching practice will be developed, refined, and extended thereafter.

Orienting Assumptions

Any mapping of the terrain of teaching practice is based on some set of assumptions that we set forth here. These assumptions concern how competence is conceived and warranted, toward what educational purposes teaching is directed, upon what broad principles of

learning teaching is based, and finally what normative assumptions about teaching underlie the claims set forth in the framework. Table 2 sets forth the main assumptions for this report, which is followed by elaboration of each.

Table 2. Orienting Assumptions

Main assumption	Elaboration
Competence	• Dependent on substantive, procedural, and conditional knowledge • Constituted of practices • Situated highly • Composed of planning, enacting, and reflection • Grounded in research, wisdom of practice, and professional judgment • Gauged to challenging but achievable aspirations
Purpose	• Is broad set of goals and purposes • Oriented to new standards of learning • Emphasizing equity, extending access to all students

Learning	• Teaching that is responsive to key underlying principles of human learning and development:
	  • Students bring preconceptions and prior knowledge to the classroom, which teachers must access to promote understanding
	  • Subject matter understanding involves deep foundation of factual knowledge together with conceptual frames for knowledge retrieval and use
	  • Metacognitive approaches help students assume control of own learning

Teaching	• Is a complex activity and role • Is iterative, dynamic process • Involves continuously adapting to learners and learning • Uses family and community cultural assets to connect diverse learners to curriculum • Provides access to curriculum in multiple ways • Employs and balances general and subject specific instructional practices • Creates learning community among students • Employs multiple discursive practices • Provides carefully structured opportunities for student inquiries • Is mindful of and responsive to new technologies • Is essentially collaborative work • Comports with ethical standards for the profession

On Competence

The generally accepted definition of *competence* is the ability to do something well. *Competencies* are generally understood to be the behaviors, knowledge, and skills that a person needs to perform a job well, which centrally includes the ability to adapt. As Sfard (1998) noted, "Competence means being able to repeat what can be repeated while changing what needs to be changed" (p. 9).

Competencies are often defined in terms of knowledge, skills, and other attributes, or knowledge, skills, and judgments (Kane, 1994). These phrases are meant to indicate that competence involves using some combination of substantive or propositional knowledge (knowing that), procedural knowledge or skill (knowing how to), and conditional knowledge (knowing when to, the exercise of judgment in the application of knowledge and skill). A central assumption is that all three types of knowledge enter into competent performance.

Approaches to defining competence sometimes rely on lists of the knowledge needed to practice (Eraut, 1994). But too heavy an emphasis on knowledge can obscure the fact that competence requires action. And so central to this document is a second assumption: that competence is composed of a core set of practices in which teachers engage.

These practices entail the dynamic use and integration of the propositional knowledge, procedural knowledge, and conditional knowledge described above. Hence, this does not mean that this framework is absent attention to requisite knowledge and skills. Knowledge is regarded as prerequisite to competence, with references to useful knowledge indicated within (or across) the competency statements. For example, a considerable body of research has accumulated around the topic of human motivation, with a range of contending theoretical orientations. Contemporary approaches include achievement goal theory, social cognitive theory, self-determination theory, and expectancy-value theory (Anderman & Dawson, 2011). Knowledge about motivation is clearly relevant to teaching, but rather than enumerating all of such that might be useful to teachers, we indicate throughout the descriptions of competencies what knowledge teachers may draw on to inform their practice. In this manner, we keep the focus on the practice, on knowledge enacted in action.

Further, dispositions—more or less stable learned traits of individuals—may also be associated with competence. In teaching, for example, such attributes as warmth, enthusiasm, relentlessness, and others are often associated, not least in popular conceptions, with effectiveness (Shechtman, 1989). A distinction contrasts teachers' manners with their methods, reckoning that both are important (Fenstermacher, 1992). If method is the means through which to convey knowledge, manner is thought to be the means through which teachers develop relationships with students, motivate learning, create expectations, and model civic and democratic values. But no single set of dispositions has been found to be effective in promoting learning among all students, although certain

dispositions, by definition, are associated with teaching effectiveness. Teachers,[1] for example, believe that their students can learn and convey these beliefs in their interactions with students. This framework then does not enumerate a set of desirable dispositions per se, but does reference the core value commitments (such as caring and respect) that underlie all of good teaching.

A third assumption deals with the grain size at which to describe competencies. The framework of necessity presents competencies at a relatively high grain size, acknowledging that teaching is a highly situated practice within which judgment is continuously employed in response to particular features of teaching situations. Scholars portray teaching as a nested set of practices of varying grain sizes (Boerst, Sleep, Ball, & Bass, 2011). Further decompositions of these competencies then will be necessary to specify where they can be found in the details of teaching's situated activities. This decomposition includes much more detailed specification of practices in the contexts of specific subject matters, grade levels, student populations, and school settings.

A fourth assumption about competence notes that teaching shares with other forms of professional work three phases of activity—the preactive, interactive, and reflective—in each of which certain competencies manifest themselves. The preactive phase involves the design and planning of teaching. The interactive phase describes teachers' direct work with their students in classrooms and other settings. And the reflective phase occurs when teachers take stock of their plans and interactions in order to detect and work on problems, adjust and adapt what they doing, and make improvements in their practice. While these phases appear sequential, they typically occur in constant interaction with one another as teachers plan, enact, make adjustments, act further, study results, revise plans, and adjust yet again in an ongoing flow of activity. Notably, the assessment of learning takes place across all of these phases, encompassing how teachers plan assessments, how teachers assess learning during instruction, and how teachers review assessment results during reflection as a basis for further teaching.

Fifth, as elaborated next, competencies are warranted to the greatest degree available on rigorous research, buttressed by wisdom culled from practitioners and professional judgments of experts most knowledgeable about teaching. This is the standard for all fields of professional work.

Finally, approaches to competence also contend with a tension between contemporary practice and what various constituencies may deem desirable or aspirational. The new standards for learning as embodied in the Common Core State Standards, for example, and much of the scholarship on teaching project a practice that has proven difficult to enact on a

[1] The report refers repeatedly to teachers in describing competence. The intended reference is to competent teachers, or teachers who possess or employ the relevant competencies. To keep the text simple, the term teacher alone is employed.

regular basis in today's schools. The "heavy hand of history," as Lortie (2002) phrased it, exerts strong influence on instruction. Where to position competency statements in response to this tension between the real and the ideal is a crucial issue. Our choice emphasizes aspirations set within achievable but challenging bounds. These competencies then are stretch goals for the profession, accompanied by an acknowledgement that the field has much to learn about the enactment of competence in the many circumstances of practice.

Warrants for Claims About Competence

Knowledge about teaching effectiveness has grown steadily over the past 25 years, with some areas such as early literacy receiving considerable attention and other areas such as the social studies, much less so. Claims for competence in teaching rest in part on evidence of their efficacy as well as on a logical argument for their appropriateness.

The competencies described here are warranted on a combination of criteria that include logical claims, normative or value propositions, and empirical relationships between practices and outcomes. It is incumbent that an account of competence draws as deeply as possible from the research on teaching and learning, articulate the logical bases for such a framework, and make clear the value propositions that inform the approach to teaching that is advocated. While research on teaching relevant to this framework has been steadily accumulating, the communities of researchers conducting the research have not consistently sought ways to integrate accumulating knowledge across myriad fields. Research on effective cooperative group instruction is not (necessarily) conducted using the same disciplinary frames, theories, research questions, instruments, or data analytic techniques. Likewise, research on mathematics education in elementary schools is not articulated with literacy research in elementary schools or in science or social studies. Research on assessment is not integrated with research on classroom management, and research on motivation is not often explored in subject-specific ways. Researchers interested in working with English language learners (ELLs) do not consistently collaborate with mathematics or history education researchers, and special education research on teaching is not consistently integrated with research on teaching inquiry or critical thinking. Yet it is at these intersections that teachers work. Teachers, thus, are left to integrate the research, negotiate any contradictions, fill in the gaps where no research provides clear guidance, and rise to the challenges presented by teaching that are not readily resolved with research knowledge.

Affordances and Limitations of the Research on Teaching

Of relevance here as well, much research on teaching that is judged as rigorous enough to be trusted (no matter the research traditions used to conduct the research, which we discuss below) has used narrow operational definitions of effectiveness. An overreliance on standardized tests that are acknowledged as narrow and (sometimes) flawed has left an

evidence base that does not speak to the broad array of learning outcomes that this framework proposes (Good, 2014; Good, Wiley, & Florez, 2009).

Another point bears mention as well. While it is clearly desirable to warrant claims about teaching effectiveness in well-conducted research, there is simply insufficient empirical evidence that speaks to the contextual, situated work of teaching and learning. The contexts of schooling are a moving target and research always lags behind schooling's realities. A case in point is the penetration of technology into teaching, both in terms of children's emerging uses with implications for their learning and the prospects for teachers' uses of technology to enhance learning. This framework then should be conceived as a living document intended for continuous revision in light of emerging research-based evidence.

We note also that teaching is work that depends heavily on what Bruner (1986) called *narrative and paradigmatic ways of knowing*, accessing knowledge that is both context-sensitive and context-independent. Teachers, that is, rely both on case knowledge—such as lawyers, doctors, and those in the corporate sector—and on knowledge that is more propositional and algorithmic, produced by large-scale studies that can identify trends that work on average (but not necessarily for the individual student; Gage, 1985). This means that high-quality case studies are as important to teaching as are large-scale experimental studies, offering insights about clinical as well as statistical prediction (Meehl, 1965). Case studies portray individuals in all their complexity; experiments produce insights into average response. In this mapping of the terrain, we attended to rigorous research across research traditions, while also consulting our own judgments about how to interpret, use, and even extend what has been expressed in the studies and commentary on teaching. In particular, we reviewed best practices as they are represented in professional standards set forth by professional communities and expert opinion. No professional community has research-based evidence for all of its expectations for practitioners, and the reliance on professional wisdom together with expert and ethical judgment is commonplace across professions.

These issues—limited integrated work, research that uses a narrow range of outcomes, the need to attend to research from multiple traditions, and the limitations of research—presented several issues in developing this account. First was the matter of synthesizing disparate research literatures in productive and efficient ways. For each competency described herein, we consulted literature reviews, curricula for teacher preparation and professional development, professional organization standards, and original research. We used the standards of the American Educational Research Association (AERA, 2006, 2009) for both humanistic and social science inquiry to guide our selection of research. We also looked to work by scholars of teaching and teacher education who have brought together research on how students learn and used it to provide syntheses of what teachers need to learn—and be taught—in order to teach responsibly and responsively.

In summarizing the implications of learning theory and principles for teaching, the National Academy of Education sponsored two volumes, one that took up teaching in general, the other that concentrated on the twin themes of learning to read and reading to learn. These volumes, *Preparing Teachers for a Changing World* (Darling-Hammond & Bransford, 2005) and *Knowledge to Support the Teaching of Reading* (Snow et al., 2005) brought together a considerable body of scholarship around these topics, setting forth a formidable agenda for teacher learning. As the decision to treat reading separately suggests, a large volume of research on literacy teaching and learning alone has accumulated and is available as one source for best practices. Scholars in the mathematics and science education communities have been as rigorous in studying and advancing the knowledge and skills of most worth in teaching these subjects as well.

Our reviews also included a wide range of existing competency models in teaching and in other fields including the INTASC standards (Council of Chief State School Officers, 2013), Danielson's (2013) framework for teaching, the edTPA framework and rubrics (http://edtpa.aacte.org), the Teach for America standards and rubrics (Farr, 2010), and the high-leverage practices developed by TeachingWorks at the University of Michigan (http://www.teachingworks.com). Also reviewed were prominent, research-based observation instruments for which some validity evidence is available. These included the *Classroom Assessment Scoring System* (CLASS; Pianta, Hamre, & Mintz, 2011a, 2011b), the *Protocol for Language Arts Teaching Observation* (PLATO; Grossman, Loeb, Cohen, & Wyckoff, 2013), the *Inquiring into Science Observation Protocol* (ISIOP; Minner & DeLisi, 2012), and the *Mathematical Quality of Instruction* (MQI; Hill et al., 2008) instruments, among others.

The synthesis proposed here maps a sprawling landscape of research, best practice, and professional standards for teachers and current efforts to capture teaching practice through observations, planning documents, and artifacts. As noted, this document is a work in progress to be constantly revised as additional evidence is produced; it serves as an invitation to the field of research on teaching, teacher learning, and teacher education to conduct high-quality, rigorous research on the critical issues associated with competence in teaching.

Limitations To Be Noted

A framework for teaching such as this one portrays competence in what might be termed a *structural* rather than *dynamic* fashion. In these conceptions, domains are identified, categories established, and statements decomposed at progressively finer grain sizes. These moves establish a structure for competence in teaching, but such a depiction misses how such competencies are combined and integrated into planful, dynamic action sequences that make up the practice. An example makes the point:

> An introductory lesson for first graders on predicting events in a story or decoding words with a silent "e" (e.g., tap and tape) might involve explanation, modeling, scaffolded practice, and gathering formative assessment information. The next lesson might involve review, reteaching, or extension combined with additional practice and assessments of students' grasp of the new concept(s). Follow up lessons are likely to focus on practice and application, including small group activities or discussion. At the appropriate point, based on information from formative assessment activities, a summative evaluation should be administered. This might occur at different times for specific students. (Pearson, 2014, p. 4)

Even such a small, stylized slice of instruction suggests that teachers employ multiple competencies in unfolding sequences of action based on planning that is ongoing and interwoven with interactive instruction. To note then that teachers must know how to, for example, provide explanations, scaffold, and formatively assess learning is to miss the competencies' complex, unfolding relationship in practice. By their nature, competency statements portray teaching in static fashion, but in practice competencies are dynamic, interactive, and in constant conversation with the situation.

Both to capture this iterative process and to remind readers of the permeability/ interdependence of the categories we propose here, we intentionally built overlap into the competencies. For example, what appears in planning for instruction naturally follows in enactment in the classroom. Teachers plan and then use assessments, design and implement tasks and activities, and select and carry out purposes. The framework tracks on these commonplaces while cross-referencing them. In this way, we hope to keep the competencies streamlined and not overly redundant, while also acknowledging the interdependent, iterative nature of teaching competence.

On the Purposes of Education

A cardinal assumption underlying this framework concerns the broad range of goals and purposes toward which education is directed. Competency in teaching cannot be oriented to a narrow set of outcomes, a point reinforced by policymakers today with their interest in the inclusion of children with special needs in regular classrooms, broad-based 21st century skills (e.g., National Research Council, 2012a; Trilling & Fadel, 2009), and more complex forms of learning beyond basic skills. As a first order of business, teaching competencies address a broad set of outcomes that encompass intellectual, emotional, social, and civic learning and development.

Certainly this involves strong emphasis on the academic outcomes of schooling, which increasingly embrace more challenging and complex learning objectives as these have been set forth in common and high standards for learning in the core areas of English/language arts, mathematics, and science (see http://www.corestandards.org/read-the-standards/ and http://www.nextgenscience.org/next-generation-science-standards). These new standards

of learning raise, even dramatically, the demands for what students learn in school with the end goal of college and workforce readiness for all students. What it will mean to teach to these new standards and to the assessments that accompany them is an emerging challenge.

An emphasis on workforce skills also includes reference to such matters as the ability to work collaboratively, to think creatively, to develop cross-cultural understanding, to become media literate, and to acquire important noncognitive capabilities such as grit, tenacity, and perseverance that have been associated with life and work outcomes (see Levin, 2013; U.S. Department of Education, 2013).

At the same time, other scholars have emphasized the importance of attending to students' social and emotional learning (see, for example, descriptions at http://www.casel.org/social-and-emotional-learning/). This includes acquiring and effectively applying the knowledge, attitudes, and skills necessary to understand and manage emotions, set and achieve positive goals, feel and show empathy for others, establish and maintain positive relationships, and make responsible decisions.

A particular challenge with respect to this agenda in the United States involves balancing attention to goals that may be measured and assessed with those that develop more gradually and less certainly and that may not be amenable to assessment yet retain high salience and importance. We take the stance that teachers ought not limit their attention just to those goals that may be measured with ease; teachers should attend to the full range of goals and purposes that have been established by tradition, policy, and public expectation. Society holds them accountable for a broad array of goals, some of which are not easily measurable.

These broad goals summon an equity assumption as well, for they must be extended to all students, even as the character of the student body in U.S. schools continues to undergo change (Hochschild & Scovronick, 2003). Public school teachers in regular classrooms engage increasing numbers of ELLs together with a continuing population of students with special needs. Other social conditions, too, work influence on students. Today, a significant number of students live below the poverty line and come to school with a range of specific needs that teachers must address. Teachers in American schools always have faced a wide range of differences among students, but these particular developments serve to set the challenges in the years ahead. Equity means designing and continuously adapting instruction to learner needs as conditioned on a complex set of factors without reducing challenge and demand and without succumbing to the tyranny of soft expectations. The pursuit of equity sets a distinctive challenge for teachers to develop understanding of the cultural, economic, linguistic, and other circumstances of children—whose lives may be very different from those of the typical teacher—as one indispensable basis for extending high quality education to all.

Central to this framework then is the assumption that there is no normal child, no normal instruction that one adapts to the differences of diversity. Instead, instruction is always

contextualized, always designed with the needs of particular students in mind. Adaptation is, of course, essential, as teaching unfolds and teachers see where their students soar and where they get stuck. But adaptation is not from some abstract mean, but instead based on the very real complexities that teachers see and understand in their students.

On Principles of Learning

Over a decade ago, the National Research Council (2000) set forth a seminal report, *How People Learn,* which provided comprehensive summaries of contemporary research on learning in general and more particularly in the central subject matters of schooling. The findings and generalizations of this report continue to be relevant in describing essential principles of learning, summarized succinctly in the following claims:

> Students come to the classroom with preconceptions about how the world works. If their initial understanding is not engaged, they may fail to grasp the new concepts and information that are taught or they may learn them for purposes of a test but revert to their preconceptions outside the classroom.
>
> To develop competence in an area of inquiry, students must: (a) have a deep foundation of factual knowledge; (b) understand facts and ideas in the context of a conceptual framework; and (c) organize knowledge in ways that facilitate retrieval and application.
>
> A metacognitive approach to instruction can help students learn to take control of their own learning by defining learning goals and monitoring their progress in achieving them. (National Research Council, 2000, pp. 14–18)

A deceptively simple aphorism captures the essence of these principles: "The more the student becomes the teacher and the more the teacher becomes the learner, then the more successful are the outcomes" (Hattie, 2009, p. 25). This saying draws attention to the first principle—how teachers plan and enact their lessons based on an understanding of students' prior knowledge, interests, cultural backgrounds, and the many other factors that influence the course of learning. Teacher-as-learner places a strong emphasis on the ability to assess learners and learning in the course of teaching (Sherin, 2002), to access the unfolding course of student thinking and understanding as a basis for continuing instruction in the moment and in subsequent teaching.

The second principle underscores that learners cannot think critically and creatively in the absence of content knowledge, as E. D. Hirsch (1999) and others have argued. Emphasis in contemporary standards of learning on students' capabilities in supporting conjectures with reasons, developing cogent arguments, conducting inquiries, thinking critically and creatively all rely on the content knowledge that composes the factual basis for disciplinary knowledge. Teachers also attend to the big ideas in the disciplines that help to organize facts and information into broad frameworks. They assist students in developing conceptual

understanding that organizes facts into broad patterns, schemas, and frameworks for use in intellectual work. In their synthesis of teaching effectiveness research, for example, Seidel and Shavelson (2007) found domain-specific activities to have the highest associations with learning.

Finally, considerable research supports the third principle wherein students become self-directed learners capable of monitoring their own thought processes, setting goals, and working to achieve them (i.e., student as teacher). Meta-cognition has emerged as a central feature of the learning that teachers impart to students, not least those with special needs. Creating opportunities for student choice and autonomy in the midst of guided instruction is an important pedagogical principle supported by both research and the value-based principle of creating self-directed learning. Teachers empower and enable students to guide and direct their own thinking, to create meaning, to make connections among ideas, to build skills of inquiry and deliberation.

These meta-cognitive aspects of learning feature in how teachers monitor learning and provide feedback, pose questions, model disciplinary thinking, orient inquiry-related lessons, and utilize strategy instruction in reading across the curriculum (Bolhuis, 2003). Taken together then these principles of learning provide the basis for the instructional practices emphasized in this framework.

On the Nature of Teaching

This account of competence is based on a complex set of assumptions about teaching, which are reflected throughout and across the domains, competencies, and practices that compose the elements of the framework.

First, *teaching is conceived both as a complex activity and a complex role*. Teachers' work is primarily located in the instructional domain, but teachers also fulfill responsibilities in the professional domain as independent but contributing to instruction. That is, teachers' observation of legal and ethical duties, their work with families and in community, their work with professional colleagues, and their long-term efforts to improve their instruction continuously all contribute to instructional quality and student outcomes.

Next, *instruction is conceived as an iterative, dynamic process* of planning, teaching, assessing, adapting, revising, reassessing, and reflecting on the educative experiences teachers craft for their students. A framework of necessity pulls these processes apart, but in the real world of classrooms and schools, there is no unidirectional ordering, no simple linear process. As the work of human improvement, instruction requires teachers to be planful, adaptable, flexible, responsive, and attentive (D. K. Cohen, 2011). Instruction occurs in a constant flow of thought and action.

More particularly, *teaching requires learning how to adapt instruction to learners*, serving as one hallmark of excellence. This assumption about teaching places emphasis on how

teachers assess the course of learning and development, a crucial competence that appears in teacher planning, instructional practice, and efforts to improve instruction woven into the ongoing flow of activity. Adaptation involves how teachers determine students' readiness to learn what is next in the curriculum and how to modulate their instruction in response to diverse learner needs. Adaptations occur moment by moment during instruction and they occur as teachers plan and replan their lessons and units in response to the unfolding of learning.

A full elaboration of the point would require that for each competency, a complete description or enumeration of its adaptations would be provided. For example, when teachers plan and enact small group instruction, they take into account many features of their students that might include language fluency and capability, special needs,[2] cultural characteristics, background knowledge, interests, informal social groupings and friendship patterns that have formed among students, social status differences, and others. Managing instructional groups is a complex practice that involves teacher knowledge about the specific students, the academic and social goals being pursued, the prior experiences students have had working in groups, and other factors. But to elaborate how all of these contingencies operate for every competency extends beyond what this framework can usefully depict. Further, as students cannot be *essentialized*, that is, reduced to a set of static, basic traits given their characteristics and backgrounds, such an elaboration would be impossible. As contextualized and situated work, teaching requires that teachers are fluid and flexible in adapting to the specific needs of the students they are working with at a particular time and in a particular place.

To manage this issue, we chose to exemplify selectively how competency in teaching is responsive to student diversity, using examples, rather than a full enumeration, to describe such adaptations. We acknowledge that to represent fully how teachers, for example, adapt their instruction to special needs students of all kinds, would require much more extensive description. These enumerations are best done in the context of specifying competencies for particular licensure areas. Here the goal is to demonstrate that it is possible to describe generic competencies and the ways in which those are consistently adapted to specific students, without treating *adapting to students* as one isolatable domain as it is central to every decision and action a teacher makes or takes.

Contemporary scholarship on teaching (e.g., Gay, 2000; Gorski, 2013; Valencia, 2010) also calls for teachers to counteract deficit-oriented responses to students, families, and communities, advocating rather an assets-oriented approach (Kretzmann & McKnight,

[2] This framework employs the phrase *students with special needs* to refer to the wide spectrum of students with disabilities of various kinds that include physical, behavioral, emotional, and cognitive, as well as those students with multiple disabilities. The majority of such students will be integrated in part or in full into regular classrooms, sometimes accompanied by aides or special education teachers. The competencies identified in the framework are intended to apply to regular classroom teachers as they share in the responsibility to educate these students.

1996) that *seeks out and employs a range of student, family, and community resources* that teachers then connect to instructional and curricular purposes. Teachers, this assumption holds, develop cultural sensitivity to students who come from backgrounds different from their own. Teachers translate this sensitivity not only into their everyday interactions with students, but also into their curriculum and instruction, devising ways to build bridges between the cultural resources available in students, their families and communities and the broad purposes of education. In this sense, teachers are culture workers who challenge and work against standard assumptions, barriers, and boundaries created by class, race, ethnicity, gender, and other features of social life.

Teachers also consult principles of universal design for learning (CAST, 2011), or UDL, to provide *access to the curriculum for all students*. Access here involves a wide range of supports and services for students whose physical, emotional, cognitive, or other characteristics may influence their engagement in lessons and in the classroom community.

Yet another assumption involves *balancing attention to general and subject specific teaching practices*. While a considerable body of research has formed around generic teaching practices (e.g., Good & Brophy, 2008; Hattie, 2009), contemporary scholarship on teaching proposes that for the academic goals of schooling teachers must develop practices that depend on instruction and learning that are intimately linked to particular subject areas (e.g., Ball, Thames, & Phelps, 2008; Shulman, 1986a, 1986b, 1987). This assumption merits teachers' attention both to general models and methods that enjoy empirical support and to the subject-specific aspects of instruction that rise out of deep understanding of the disciplines of learning and of the pedagogical practices associated with disciplinary knowledge (Grossman & McDonald, 2008). For example, aspects of teaching such as managing small group work benefit from general practices that apply across content areas. Aspects of teaching such as eliciting student thinking in particular knowledge domains benefit from research grounded in and specific to those domains. Teachers then draw on and balance general with subject-specific practices.

An emerging theme in the research on teaching describes how *teachers create a learning community among students* where learning is conceived as a social process that engages students in participatory and collaborative activity with an emphasis on how students assist one another in the process of constructing knowledge (Lave & Wenger, 1991; Sfard, 1998; Wenger, 1998). This perspective complements traditional approaches to classroom management through an emphasis on how disciplinary communities go about the work of building knowledge, creating classroom norms, rules, and procedures that support deep thinking in the particular disciplines that make up the school curriculum (National Research Council, 2005).

A closely related assumption is that *teachers employ multiple discursive practices* that provide scope for student discussions and interactions through which to explore ideas, arguments, and hypotheses aimed at deep understanding of subject matter (Resnick,

Asterhan, & Clarke, 2015; Resnick, Michaels, & O'Connor, 2010; Shanahan & Shanahan, 2008). In particular, the orchestration of discussion in whole, small group, or paired formats forms a critical accompaniment to more teacher-centered discourse aimed at conveying information. Discussion-based teaching in all of the subject areas creates opportunities for student voice and engagement in processes of knowledge building, so this assumption holds that teachers integrate a variety of discursive practices into their instruction.

As well, another assumption holds that *teachers provide carefully structured opportunities for student inquiry*. The creation of teacher- and student-initiated inquiry is critical across subject areas, noting that for such inquiry to genuinely inform student understanding, it must be carefully structured and guided by the teacher (e.g., Mayer, 2004; Windschitl, Thompson, Braaten, & Stroupe, 2012). In all contemporary learning standards, inquiry, critical thinking skills, habits of mind, and intellectual practices are seen as integral to conceptions of subject matter knowledge. That is, content knowledge is incomplete without developing students' understanding and ability to engage in a discipline's practices.

Then, too, *teachers are mindful of and responsive to emerging opportunities for teaching and learning supplied by new technologies* (Fishman & Dede, in press). The advent of technology is beginning to alter the educational landscape. Students today access electronic textbooks and computerized tests, come to school tech savvy, and use technology in both positive and harmful ways (e.g., cyber-bullying). Teachers today are familiar in general with commonly used technologies, they know about specific applications relevant to the subjects they teach, and they use technology as a new mode of instruction, in online and hybrid learning formats, which are gaining significance in secondary and postsecondary education. Technology also is emerging as a critical resource for students with special needs and teachers are familiar with such uses that assist in extending access to learning (CAST, 2011).

Teaching is essentially collaborative work with colleagues, other professionals, and with families and communities (S. M. Johnson, 1990; Kardos & Johnson, 2007; Kardos, Johnson, Peske, Kauffman, & Liu, 2001). Teachers must work on teams and in departments, mentor and guide novices, and serve on school and district committees. Through their collective work, teachers shape the culture of the schools they work in. They consult with other professionals, including guidance counselors, social workers, special education personnel, and district supervisors, on a wide range of issues. Teachers exercise leadership through their collaborative activity. And they communicate with, learn from, and engage families and community resources to enable their work with students. Competence then includes reference to this range of collaborative work.

Finally, this report embraces an assumption common to all forms of professional work that teaching *comports with the profession's ethical standards.* Professions include codes of conduct as well as standards for effective practice, and teachers conduct themselves in accordance with common ethical principles. As work of human improvement, teaching is inherently an ethical practice that requires teachers to manage dilemmas of various kinds

and to act in ways that support students' best interests, sometimes in the face of countervailing pressures. Good teaching then relies on technical skill, but also on the exercise of professional conscience (Green, 1985).

The Competencies of Teaching

The body of this report develops a set of broad competencies within two domains, beginning with the work teachers do in relation to instruction and then their work in fulfilling a set of professional responsibilities that both support instruction and are critical in their own right (see Figure 1).

Within each of these domains, we enumerate a set of subdomains, each of which can also be parsed into competencies and practices. Because we based this framework on a synthesis of wide-ranging literatures, we were faced with finding ways to impose a standardized language on fields that do not always communicate with one another. Some fields speak of competencies, others of practices. This issue is exacerbated by the fact, as we have already mentioned, that practices are not all of the same grain size. Further complicating matters, the research literature is uneven as to how deeply investigators have explored specific practices, methods, or teaching strategies or regimes that are related to student engagement and learning. We aimed for consistency in this document to the extent available across disparate literatures.

We handled these ambiguities in the following manner: The framework involves two broad domains, instruction and professional responsibilities. Within those domains, we have described a set of competencies. When the literature provided sufficient insight to explore those competencies in more detail, we broke those competencies into practices. This means that we largely used the terms *subcompetency* and *practice* interchangeably. Subcompetencies and practices entail the strategic use of both knowledge and skill(s), and in that sense, practices are never narrowly defined as specific instructional strategies.

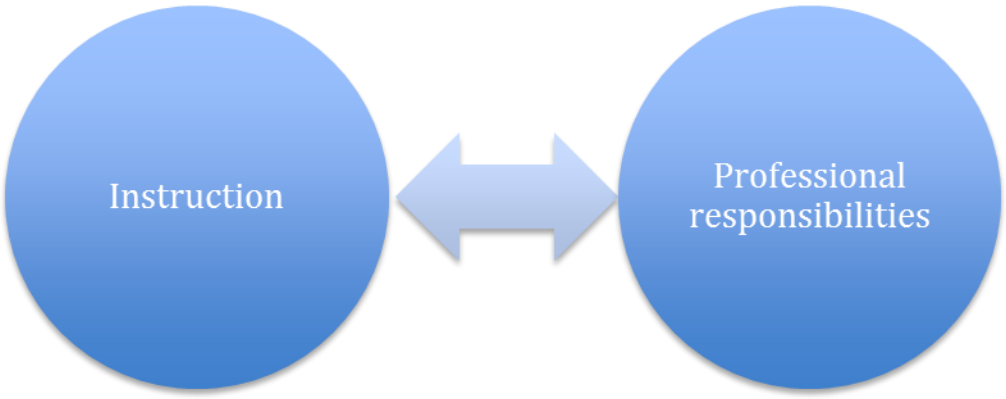

Figure 1. Two domains of teaching competence.

The Instruction Domain

The first major domain of teaching competence involves the central work of teaching: instruction (see Figure 2). As already indicated, these competencies involve the three interrelated aspects of planning: creating plans, enacting plans, and studying and revising plans and actions for purposes of improvement (see Table 1). So, for example, teachers plan the assessments they will use, administer assessments in the course of teaching, and study the results of assessments to inform ongoing planning and instructional improvements over time cycles from day to day to the academic year (for a detailed case exemplifying this process, see Lampert, 2001).

A broad premise is that competent planning informs instruction in ways that make it more effective and productive. And engaging in practices of study, analysis, and reflection improves instruction over time as the teacher gains and makes use of experience and formal study.

In these linked processes, assessment in particular plays a central role and appears repeatedly within this framework. Assessment is critical and intertwined with other competencies. Teachers plan and continuously revise plans for their use of assessments, employ assessments skillfully in instruction (formative assessment is a central practice of instruction itself), and use assessments to evaluate the instructional outcomes and to provide input for longer term efforts to systematically improve their instruction.

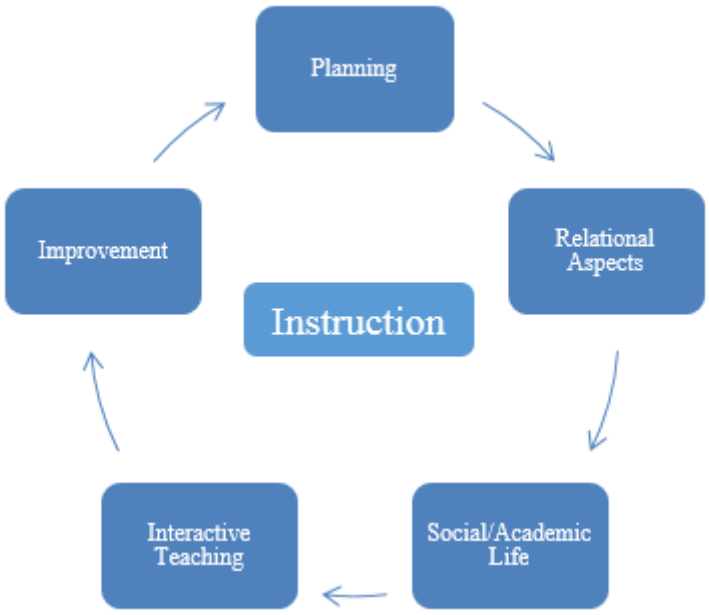

Figure 2. The instruction domain.

Selecting and Adapting Resources for Use in Instruction In sum, instruction—conceived as the moment-by-moment interactions among teachers and students—is central to this framework. Each subdomain can be described separately, but is best understood as dynamically, iteratively, and fluidly interacting with and drawing upon the others. Further, each subdomain we describe here is decomposed into competencies and *high leverage practices* (for one account, see http://www.teachingworks.org/work-of-teaching/high-leverage-practices), conceived at varying grain sizes, meaning that many subdomains require finer decomposition as indexed to such factors as the subject matter involved, the subskills and routines employed, the adaptations needed to address relevant student characteristics, and others.

As noted earlier, the domain is conceived primarily in terms of practices, the actions teachers take in and around instruction. Clearly, such actions must be informed by knowledge of various kinds, and references to such knowledge are embedded throughout.

Preparing and Planning for High-Quality Instruction

Description and Rationale

The planning and preparing for high-quality instruction subdomain points to the work that teachers do to select and organize the main elements of teaching in order to achieve desired effects on learning. This includes both individual lessons and sequences of lessons that require coherence and unity around the logical development of academic material, 21st century skills, and social and emotional goals, as well as the learning progressions through which students master such material. Planning then draws together many of the other competencies that teachers attend to as they prepare to teach. For example, in planning and design, teachers establish purposes for learning, select and modify resources, choose grouping arrangements, and plan for how to use assessments of various kinds. And as noted earlier, they do all of this not in the abstract, planning some idealized version of their work, but rather with full knowledge of their particular students and those students' needs, experiences, strengths, and backgrounds.

This subdomain then points to how such elements are organized and coordinated to yield learning. Ultimately teachers arrange these elements into tasks, activities, and experiences that promote student learning across a broad set of short- and long-term goals. Plans attend to what teachers and students will do together in learning environments: the roles they play in various instructional formats (e.g., seatwork, paired groupings, lecture), the learning tasks that make up what students are working on, the activities through which students are engaged on the assigned tasks, the technological supports and affordances to be used, and how learning will be assessed during instruction.

Teachers plan with the guidance provided in the standards of learning, the curriculum materials, the pacing guides, and other resources that schools and districts provide. As well, many resources now exist for teachers to access online in the form of lesson plans and

materials gauged for use in response to learning standards and instructional goals. In this environment, teachers select and adapt these resources flexibly and knowledgeably in response to their students, adjusting them to students' backgrounds and needs. Teachers in this capacity are informed consumers who make good use of available resources. At the same time, they supplement and complement such resources, as needed, with their own plans, materials, and activities for learning.

A particularly important aspect of planning involves the identification of goals (de Kock, Sleegers, & Voeten, 2004). Lesson aims or goals can be coherent in two ways. Internal coherence concerns the relevance of classroom activities toward meeting a learning goal. But teachers seldom have one goal in mind during a particular activity, for their eye is on the development of social, emotional, academic, and civic ends. Thus, another form of coherence concerns the place of the lesson aims in the broader curriculum. While planning and instruction unfold continuously in interaction with one another, teachers do develop long range plans for lesson sequences and units that can be quite detailed in the preparations that are made (Grossman et al., 2013). Once instruction is underway, planning continues in response to the course of learning and developments in the classroom. Planning then is not something that occurs just before instruction, but in the course of instruction and in close interaction with instruction.

The literature on instructional planning points to a number of general considerations (Childre, Sands, & Pope, 2009; Wiggins & McTighe, 2005, 2008). One consideration invokes the idea of *backwards design*, which involves establishing goals and instructional purposes, planning learning experiences intended to achieve goals, and selecting assessments to track on the course of learning and development.

Effective design is responsive to students' entering knowledge and skills. Thus, a second planning consideration involves building on students' prior knowledge, understanding, and interest. As teachers gain greater knowledge of their students, they design instruction with students' entering and evolving competencies in mind. They may use pretests or informal formative assessments or input from colleagues to gauge their students' starting points. Implementing these desiderata acknowledges the range of starting points a class of students might present, such that teachers build forms of differentiated learning into their designs that take into account teachers' developing understanding of student growth. For example, ongoing assessments are particularly important for ELLs because standardized tests in English do not usually reflect ELLs' true content knowledge or abilities. Other forms of assessments can provide a more well-rounded picture of their skills, abilities, and ongoing progress, including performance-based assessments while students are reading with partners, retelling stories, or role playing.

Responding to student diversity involves two other considerations as well. One is to align classroom activities and tasks to learning goals in ways that provide multiple options for students to acquire and demonstrate their mastery of the content. Such design then serves

as one means of accommodating student differences while also supplying rich and varied feedback for the teacher. Effective designs draw on and build in a range of methods that allow students to express their knowledge and understanding (Brookhart, 2001; Shepard, 2001, 2005, 2006). For example, teachers use culturally responsive assessment strategies that mitigate the biases inherent in some traditional forms of assessment. These include contextualized and authentic tasks, portfolios and process-folios, test and testing formats that have been critiqued for bias, and self-assessment. Furthermore, technology comes into the account particularly as it aids access for students with disabilities, for instance, with alternative keyboards, speech synthesizers, talking spellcheckers, and the like (CAST, 2011).

Second, teachers typically plan instructional tasks, but they may also include ways for students to design their own activities and experiences because this is an important aspect of learning. Student choice can assist with motivation, serve to promote learning how to learn, and draw on the interests that students have. Another consideration then opens space for students to take a direct and active role in planning themselves, with the teacher monitoring focus on main learning goals (Bolhuis, 2003).

Finally, instructional plans must be flexible and adaptive in response to the actual unfolding of learning and to unpredictable developments that teachers attend to. Instruction is planful around well-conceived designs and responsive to circumstances that arise in the classroom, to teachable moments that take teachers off the plan, to initial miscalculations teachers make about what students know and do not know, how much time certain activities might consume, the pacing and flow of connected lessons, and the like.

Here we identify seven elements of instruction for which teachers plan. These elements correspond with seven subdomains under the general subdomain of preparing and planning for high-quality instruction (see Table 1). We note here that, throughout the document, the subdomains, competencies, and practices are drawn from existing research literature when possible, existing standards and best practices literature, or—at times—the result of logical task analyses.

Again, there is a dual emphasis in these planning competencies between the work of selecting and adapting resources that are already provided/required and making original or distinctive contributions to these elements of planning.

Drawing on Students' Cultural, Family, Intellectual, and Personal Experiences and Resources

Teachers who know their students and know the resources that they bring to instruction are more likely to build effective relationships with them and to be able to connect learning to their students' experiences. To do this, teachers make connections with and learn about the communities and families of their students, and listen to and observe their students. They tap into students' *funds of knowledge* as one important basis for instructional planning (Delgado-Gaitan, 1991; Gonzalez, Moll, & Amanti, 2005). Teachers commit to learning about

their students' lives, particularly in cases where they possess little prior understanding and must counteract potential biases and blind spots. This work is done over time and throughout the course of teachers' engagement with students. We place this aspect of teaching at the planning stage to indicate that teachers draw on their knowledge about students beginning with their plans, which then they carry through all aspects of their work. To see how this competency fits into the subdomain of preparing and planning for high quality instruction in the domain of instruction, please go to Table 1.

The practices involved with this competency include the following:

- Gathering information about students' home and community life as resource
- Planning/using funds of knowledge to engage students with lesson purposes and content
- Drawing on funds of knowledge in relationship-building with students
- Encouraging a critical spirit among students in relation to cultural issues and questions

Promoting Community Participation as Opportunity to Explore Core Values

A critical aspect of teaching involves ways that teachers build connections between students and the curriculum (Morrison, Robbins, & Rose, 2008; Lee, 2007). This is a critical competency as it exerts influence on student motivation, interest, and understanding of the content of instruction. Teachers gather information about their students in many ways, some formal (e.g., surveys and class discussions), others informal (e.g., conversations with students before and after class). Teachers use what they learn in their planning, working out implications for activities they plan, material they use, projects they design, and the ways of assessing the course of learning (e.g., in the questions they pose to students). In a literacy lesson, for example, teachers might draw students into an assigned text by noting similarities to students' culture or asking for comparisons. In a history lesson, they might introduce a unit on conflict and cooperation with a discussion of how these ideas have appeared in events familiar to students. Across subjects then teachers are alert to the wide range of possibilities for linking the subject matter of instruction to what students know and care about as these things relate to important matters in students' lives.

An important point already noted is that teachers avoid essentializing their students by assuming that certain traits or styles are associated with particular groups or that their students fit into convenient caricatures about gender, age, culture, race, ethnicity, or religion. Rather, teachers recognize the variation within and across cultural, social, and language patterns (among others) and the ways that participation in various groups produces repertoires of practice among children from particular backgrounds (Gutierrez & Rogoff, 2003). Teachers then engage in inquiry to uncover such practices among their students together with how to incorporate students' home practices into curriculum and instruction.

Other student-related features are also important to consider. For example, ELLs comprise not a single category of student but rather an array of students who differ in first-language proficiency, prior academic knowledge, levels of formal schooling, and understanding of education, among other factors. And teachers also must learn about those students with a range of special needs that range from the physical to the cognitive, social, emotional, and behavioral. Further, students may present multiple issues of this kind, as, for example, an ELL with a physical impairment. Teachers consequently engage in learning about their particular students as a basis for adjusting instruction to the full range of needs and circumstances (Echevarria, Vogt, & Short, 2004).

Finally, scholars who advocate for a culturally responsive or relevant pedagogy call for the promotion of a critical consciousness, inviting students to question, examine, even dispute the power relations between, for example, readers and writers (see, e.g., Banks & Banks, 2004, 2010; Gay, 2000; Ladson-Billings, 1994). Critical literacy practices include discussion of controversial topics and asking students to take critical viewpoints toward texts, including the hidden curriculum of schooling itself. The work of scholars such as Morrell (2002) and Emdin (2010) who use hip-hop culture to engage students in critical examinations of literature and science, respectively, serve as examples of how to engage students critically in learning academic content using their own culture and experiences. While hip-hop culture is associated with Black culture, the research illustrates an important point: culturally responsive instruction does not involve teaching different lessons to the Black students, Latino students, Asian students, or Caucasian students. Instead, using culturally responsive instruction can engage all students in learning both the cultural and linguistic norms of hip hop and academic content.

Teachers also engage students in social justice work in the community, such as making trips to soup kitchens or convalescent homes; and linking such work to the curriculum, such as in a mathematics problem exploring why prices are higher in some stores than others, or why certain items are not sold individually. Barton, Tan, and Rivet (2008) and Barton and Tan (2010), for example, described how a science after-school program engaged students and the larger community in installing a green roof on their building, which led to students' development of critical science literacy and a commitment to science activism.

As a goal for schooling, consciousness-raising also involves making explicit the power dynamics in society, which helps students to identify their location while affirming their identities. Teachers, for example, encourage students to uphold the value of their own language and culture, even as teachers assist in the acquisition of English, and they teach students how to code switch appropriately (Delpit, 1995). To see how this competency fits into the subdomain of preparing and planning for high quality instruction in the domain of instruction, please go to Table 1.

Setting Long- and Short-Term Learning Goals and Objectives

Setting goals and objectives[3] encompasses a wide range of outcomes that might apply to specific students, identified groups of students, a classroom of students, or even an entire school. These goals and objectives include attending to the social, emotional, and academic learning (SEAL) objectives but also attention to behavioral outcomes as needed and to the civic purposes of education. They embrace both short-term accomplishments and ones that span months. To see how this competency fits into the subdomain of preparing and planning for high quality instruction in the domain of instruction, please go to Table 1.

The practices for setting long- and short-term learning goals are the following:

- Including an appropriate balance of mastery- with performance-oriented goals
- Planning with clear and even measurable goals in mind from the outset (e.g., backward mapping)
- While balancing this call for clarity, paying attention to longer developing, less easily measured, but important goals
- Using learning trajectories (see below), as available
- Attending to special populations of students, including ELLs and students with special needs
- Balancing attention to deep engagement with subject matter and interdisciplinary learning
- Allowing scope for student choice of goals and activities

We briefly expand on each of these elements below.

Teachers develop balance between mastery-oriented goals that draw on students' motivation to acquire knowledge and skills and performance-oriented goals that elicit the motivation to perform rather than engage in learning for intrinsic purposes. Research has shown the overall value of a mastery orientation, with performance-oriented goals advised in some situations for some students (Rolland, 2012; Wentzel & Brophy, 2014).

Academic learning anchored in the disciplines constitutes a primary venue for goal-setting, drawing on teachers' subject matter understanding. And in the intrapersonal realm, research is uncovering some important skills including, but not limited to, developing a growth—as distinguished from a fixed—mindset. The first refers to students who regard intelligence as malleable and responsive to effort, rather than as an innate ability, immune to improvement efforts (Dweck, 2006). Also, developing the means for learning how to learn, including uses of meta-cognitive strategies and processes of self-regulation (Bolhuis, 2003; Seidel & Shavelson, 2007). As well, building intrinsic motivation to learn along with a

[3] *Goals* refer to larger and more general learning outcomes, while *objectives* refer to more specific and fine-grained outcomes that contribute to goal achievement.

characteristic referred to as *grit*, meaning perseverance and passion for long-term goals (Duckworth, Peterson, Matthews, & Kelly, 2007; Duckworth, Quinn, & Tsukayama, 2012; U.S. Department of Education, 2013). These capacities have been shown to be critical to academic learning and to have value in their own right, thereby constituting important targets for teaching. Teachers understand that various goals can complement one another or be in tension with one another, which leads to their balanced attention to a range of goals such as learning to listen to others, collaborate, and engage in respectful, civil debate.

Hallmarks of effective goal setting call out a number of features. First, teachers plan with goals in mind rather than with activities with vague purposes. Planning involves mapping back from goals to other elements of instruction in support of the goals (Wiggins & McTighe, 2005). In the current era of standards-based reform, goals and the more specific objectives associated with them involve careful embodiment, where the main elements of instruction—the learning standards, materials, activities, and assessments—are deeply and substantively aligned (Shepard, 2005). Coherent instruction involves such embodiment, which begins with the standards but does not end there, as standards generally focus exclusively on academically related goals and less so on SEAL, perseverance, passion, collaboratively working with others, and the like, goals that teachers need to integrate into activities designed to meet standards.

While guidance also indicates that goals should be clear, specific, and measurable, teachers balance this against the need to articulate those goals that may be long term and more difficult to measure. Student testing programs today place great emphasis on learning that can be measured and this is clearly an important result of schooling. But developing what some have called *habits of mind* summons teachers to keep alive such learning that takes longer to develop and that is not easily amenable to measurement.

Goal setting increasingly is oriented to expanding knowledge about how students' understandings and ability to use core concepts and explanations grow and become more sophisticated over time with appropriate instruction. Cognitive scientists today are providing evidence of these learning progressions or trajectories (Heritage, 2008). Particularly in mathematics and science, a small but empirically based literature is developing such progressions together with materials teachers may use as they create sequences of learning opportunities for students (e.g., Alonzo & Gotwals, 2012; Bailey & Heritage, 2008; Clements & Sarama, 2004, 2014; Corcoran, Mosher, & Rogat, 2009; Daro, Mosher, & Corcoran, 2011). While these hypothesized progressions may be built into materials, tools, and assessments for teacher use, teachers' understanding of these trajectories can assist in goal setting and instructional planning. Designing lesson sequences that build understanding in orderly progressions will gain prominence in the coming years, and this concept and its uses in goal setting contributes to the knowledge base for teaching. This emerging body of knowledge provides one important resource for linking short- and long-term goals as part of a teacher's plan to promote steady, deepening knowledge, understanding, and skill.

Goal setting with students in mind also includes attention to needs of individual students. As classrooms become increasingly diverse, this includes goal setting and adjustments for students with needs that are not systematically represented in standards documents, including diverse populations, children living in poverty, special education students, and ELLs. As noted earlier, teachers do not start with their goals absent an understanding of their students. Students are front and center in planning. While the dynamic aspects of goal setting respond to a wide range of student characteristics, teachers draw on concrete and specialized knowledge in working with particular populations. For example, teachers planning instruction for ELLs and for students with special needs use strategies of scaffolded or sheltered instruction, including identifying appropriate goals; identifying language strategies for students to use; using multiple questioning strategies (e.g., prompting, elaborating); using cooperative groups and partnering; and drawing from a wide array of instructional methods such as literature circles, thinking maps, questioning the author, text talks, and others (e.g., Beck & McKeown, 2001a, 2001b, 2007; Beck, McKeown, Hamilton, & Kucan, 1999; Echevarria et al., 2004; Vogt & Echevarria, 2006).

Teachers also employ syntactical and metalinguistic knowledge in identifying specific language objectives for each lesson, planning general metacognitive strategies (e.g., having a purpose in mind, problem-solving steps, study skills), and making texts more comprehensible by dissecting sentences and chunking sentences to connect structure, function, and meaning.

Several other features of goal setting add further elements to this competency. Goals may be framed in relation to particular subject matters. There are also strong reasons to form goals that are interdisciplinary in nature, that extend across subjects and engage students in bringing various kinds of subject matter to bear on problems and in projects. Contemporary standards also require planning across subject areas in order to build academic skills in reading comprehension of complex texts, adding another critical reason for this aspect of teachers' work. Further, the use of interdisciplinary and cross-disciplinary goal setting raises expectations for the learning of ELLs and students with special needs, and we propose these groups may benefit explicitly from such attention.

Goal setting as a social process points to two additional features of this competency. Teachers will often collaborate with other teachers, specialists, even parents in developing goals and objectives. Particularly as teachers set goals that are appropriate for their diverse student populations, teachers consult with other professionals to build up understanding of their students as a basis for goal setting. And goal setting implicates another key participant in the process: the student. For the most part, goal setting is assumed to be the teacher's responsibility with students as the target. But there are good reasons, including effects on motivation, to include students in the process of goal setting (including in the individualized education program, or IEP, process) such that they learn to set goals for themselves, take greater ownership in the process, and tailor goals to particular needs and interests (Bolhuis, 2003; National Research Council, 2000).

Mastering Lesson Content for Instructional Purposes

An essential aspect of instructional planning involves the teachers in doing the work of the lesson themselves. While planning instructional activities, teachers explicate the ideas and skills students are to learn. They then consider what a fully developed understanding of those ideas/skills looks like for students of a particular age. They also work through the content as presented in the lesson. In a mathematics class, this means working out the mathematics problems or proofs; in science class, it would mean engaging in a particular inquiry or analyzing data that have been collected (e.g., Bell, Wilson, Higgins, & McCoach, 2010; Peach & Campos, 2008). In English classes, it means reading the relevant text and in history classes, it might mean generating a list of pro and con points one would make in a debate or reviewing source materials and how students might interact with them (Wineburg, Martin, & Monte-Sano, 2011). The rehearsals of content allow teachers to anticipate where students might encounter difficulties or where there are specific points that the teacher needs to introduce or reintroduce in discussions, lectures, small group work, or via technology. To see how this competency fits into the subdomain of preparing and planning for high quality instruction in the domain of instruction, please go to Table 1. The practices for mastering lesson content include the following:

- Reviewing lesson content for basic substantive understanding
- Identifying relevant pedagogical and specialized content knowledge
- Clarifying essential instructional purposes associated with lesson content
- Rehearsing content to anticipate opportunities and challenges
- Understanding lesson content in relation to broader disciplinary knowledge
- Identifying locus and import of lesson content in larger unit planning

As teachers review and rehearse the content for instruction, they draw on multiple kinds of knowledge that include common and specialized content knowledge together with pedagogical content knowledge (e.g., Ball et al., 2008; Grossman, 1990; Shulman, 1986a, 1986b, 1987).[4]

[4] Shulman (1986a, 1886b, 1987) proposed that among the components of the knowledge base of teaching were subject matter or content knowledge (CK) and pedagogical content knowledge (PCK). The content of the disciplines teachers teach is CK, while PCK is a form of practical knowledge that is used by teachers to guide their actions in highly contextualized classroom settings (e.g., Baumert et al., 2010; Buschang, Chung, Delacruz, & Baker, 2012; Carlisle, Kelcey, Rowan, & Phelps, 2011; Hill et al., 2008; Hill, Rowan, & Ball, 2005; Kersting, 2008; Kersting, Givvin, Thompson, Sangata, & Stigler, 2012; Monte-Sano & Budano, 2013; Phelps & Schilling, 2004; Sadler et al., 2013). Included in PCK is the knowledge of how to represent academic content; knowledge of the common conceptions, misconceptions, and difficulties that students encounter when learning particular content; and knowledge of the specific teaching strategies that can be used to address students' learning needs. Thus, PCK represents the blending of content and pedagogy into an understanding of how particular aspects of subject matter are organized, adapted, and represented for instruction. Ball and her colleagues (Ball et al., 2008) proposed a reconceptualization of teacher CK and PCK, suggesting *content knowledge for teaching* (CKT) as a unifying concept, which then consists of aspects more purely about content, importantly to include specialized content knowledge that teachers draw on, *and* other aspects that focus more directly on pedagogical content knowledge. In this text, we use all three terms according to the definitions laid out above.

This includes reviewing areas that will be particularly challenging for students and areas that need to be reinforced. Reviews also attend carefully to the instructional purposes that teachers will pursue, together with how lesson content fits into larger disciplinary understanding and sequencing of content across lessons within units of instruction.

While there are general templates that direct teachers to the critical matters associated with content (e.g., Grossman, Schoenfeld, & Lee, 2005), this work is quite specific to the particular subject matter that is involved. For example, science teachers understand that students have predictable difficulties when learning about energy given some ideas that are hard for them to change, including the idea that energy is a thing or that an object at rest has no energy or that things use up energy. As teachers reconsider the content they will be teaching, they review their understanding of how students think about and experience the content at hand. Alternatively, a history teacher who is planning to have students work with photographs as evidence will review ways to help students understand that photographs are neither objective nor true, but are as fraught with perspective and bias as any other form of historical artifact (Felten, 2006).

As teachers engage with the content, they also develop plans for the instructional activities through which students engage with the content and the teaching strategies that the teacher uses in conjunction with learning activities. Content-oriented planning includes attention to how the teacher will assess learning, stimulate it via student activities, and guide it via teachers' strategies such that these elements cohere into a meaningful plan that integrates the main elements of instruction. This work is anchored most firmly in teachers' understanding of the subject matter and of how to connect subject matter to diverse students. Planning then as worked out on paper, in outlines and templates, in the detailed thinking of teachers, and at times in collaboration with other teachers, delves deeply into subject matter understanding as related to students' emergent understandings.

Selecting and Adapting Resources for Use in Instruction

The term *resources* here is meant to indicate both the physical materials that teachers work with in instruction and the intellectual resources teachers create—with and through materials—to advance student learning. Resources include such things as manipulatives, textbooks, lab equipment, worksheets, models, tools for inquiry, technological applications, and others. Access to the curriculum is an important consideration in selecting resources, as explicated clearly in the principles for UDL (CAST, 2011). In many cases, the district may prescribe materials of various kinds, but teachers work with such materials in a range of ways that implicate their competence (Remillard, Herbel-Eisenmann, & Lloyd, 2009 To see how this competency fits into the subdomain of preparing and planning for high quality instruction in the domain of instruction, please go to Table 1.

The practices for selecting and adapting resources for use in instruction include the following:

- Appraising and modifying curriculum materials and other resources
- Adapting materials for students' needs
- Selecting resources in light of the ongoing evidence concerning student learning

Deep knowledge of the subject, students, and the range of resources to teach key concepts and to build skills in the subject matter are critical to the exercise of this competency. Teachers appraise and modify curriculum materials and other resources to determine their appropriateness for helping particular students work toward specific learning goals. This involves considering students' needs and assessing what questions and ideas particular resources will raise and the ways in which they are likely to challenge students. Teachers critically examine the materials for obstacles some students might encounter in the vocabulary or syntax used, for example, and in light of those analyses, incorporate additional materials that draw on students' cultural practices as these build connections to the formal curriculum. Such materials may draw on other languages, use students' experiences, and integrate art forms familiar to particular cultural groups.

Literature from the special education field (e.g., Meyer, Rose, & Gordon, 2014) distinguishes several approaches to the adaptation of materials to meet students' learning and other needs. Teachers can make accommodations—reasonable adjustments to teaching practices so students learn the same materials in more accessible ways; modifications, which change or adapt material to make it simpler and more comprehensible; and selections of materials that relate specifically to student characteristics. Examples of accommodations include response (typing rather than writing assignments), presentation (audio books vs. print), setting (testing in a quieter room), scheduling (rest breaks), and others. Modifications might include simplified or shorter assignments, extra aids, and alternate projects, for example.

UDL principles organize adaptations via the provision of multiple means of representing content, responding to differences in how students perceive and comprehend information, providing multiple means of action and expression to assist students in navigating learning environments and expressing what they know, and offering multiple means of engagement to support differences in motivational aspects of learning (CAST, 2011).

Teachers then develop and adapt resources for learning within a framework that draws together three critical elements: the teachers' (a) multiple learning goals and purposes, (b) distinctive content knowledge for teaching, and (c) understanding of where their students are with respect to the learning goals, oriented to such learning progressions as are available in the subject matter (see the references above). So, for example, teachers who are having students learn about the civil rights movement would not only be thinking about teaching students about Martin Luther King, Jr. or Malcolm X or Selma or Little Rock, but also would be assessing how much students knew about Black history. Understanding civil

rights requires understanding the slave trade in the 1600s; the Dred Scott and Plessy cases; the Civil War; the 13th, 14th, and 15th Amendments; Jim Crow and; ultimately, the Brown v. Board of Education decision. Teachers would also be thinking about how unfamiliar some of this history might be to newly arrived ELLs and how to build upon the work they have been doing all year to create classroom environments in which students talked about difficult ideas with respect and depth. Teachers would have goals associated with students' emotional and social interactions, both with one another and with the teachers themselves, and would be working on the continued development of students' abilities to work collaboratively, think critically, and honor one another's differences. Teachers might also be thinking about how to tap into the home environments of students to connect these lessons to their caregivers' and community experiences.

Technology also is creating an exploding range of specific applications to assist in learning related to a wide range of goals. Again, UDL provides many examples of how technology can assist in making curriculum accessible. These include auditory and visual alternatives, electronic translation tools, and multilingual glossaries on the web; text-to-speech software; web applications; and many others (CAST, 2011). Applications in the sciences, mathematics, reading, social studies, and many other areas constitute resources for learning that teachers evaluate and then integrate into their instruction. The teacher preparing to teach the civil rights movement might be considering the use of the Civil Rights Resource Collection available through the Facing History and Ourselves website (https://www.facinghistory.org/) or of the interactive timeline on the NAACP website (http://www.naacp.org/) or drawing upon the National History Education Clearing House (http://teachinghistory.org). Technological literacy then is of increasing importance in teaching, and this literacy cuts across most competencies as teachers begin to import technology into the range of learning opportunities supplied to students (Fishman & Dede, in press).

Finally, resources for learning also must be selected in light of the ongoing evidence teachers collect about how their particular students are progressing toward goals and objectives, both individually and as a group. If a group of students is not yet skilled with persisting when they are challenged, teachers might select materials that present modest challenges. If students are adept at persisting when challenged, teachers might select other materials. As teachers accurately diagnose students' growth along the learning progressions established for a topic or big idea in science or mathematics or literacy or social studies, teachers use that knowledge in creating learning resources that will propel further learning along the relevant trajectory. And to enhance motivation, build on interest, and promote self-regulated learning, teachers also create opportunities for student choice of resources.

Selecting/Designing Instructional Tasks, Activity Structures, and Formats

This competency attends to teachers' work in selecting, developing, and adapting tasks that engage student cognition, the activity structures that shape the nature of dialogue and participation, and the formats that configure and organize task-related work. Here we identify four practices:

- Creating and adapting tasks of the appropriate cognitive complexity
- Addressing student diversity in their starting points with respect to task demands
- Planning for a variety of tasks to maintain interest and to provide suitable differentiation
- Planning for the use of a variety of formats that organize student work

Educational tasks are not all equally educative. One dimension along which they vary is the cognitive complexity of a task, ranging from basic recall to simple applications of basic knowledge and skill, to strategic thinking and complex reasoning (Webb, 1997). Teachers are aware of a range of analytic categories that have been applied to levels of knowledge and understanding, from Tyler's (1949) enumeration of various instructional objectives (understanding of facts, familiarity with dependable sources of information, ability to interpret data, ability to apply principles, etc.), to Bloom's revised taxonomy (Anderson & Sosniak, 1994) (remembering, understanding, applying, analyzing, evaluating, creating), to Marzano's (e.g., Marzano & Kendall, 2007; gathering information, organizing information, analyzing information; generating information, integrating information, evaluating information), to new frames that are being used in the development of state frameworks for curriculum and assessments, including assessments aligned with the Common Core State Standards.

Teachers understand that the nature of the tasks selected for students to work on plays a significant role in the prospects for student engagement and high-level thinking. In a science class, a lab may involve following scripted procedures or require students to engage in scientific investigation about potential factors and their relation with the phenomena under study (Kisa & Stein, 2015). Task selection then can constrain or open up prospects for serious intellectual work (Kuhn, 2015; Stein & Kim, 2009).

Each content area has particular ways of categorizing knowledge and skill. While some tasks may involve relatively low level demand, teachers also provide tasks that require students to make conjectures and formulate hypotheses, make and defend arguments with evidence, conduct inquiries of various kinds, and progressively deepen understanding of key concepts and ideas in the subject matter.

Teachers understand that all children can deal with cognitively complex tasks, and they strive to design and revise tasks that consistently push students to higher levels of reasoning and analysis. Optimal task complexity requires students to stretch in using their

minds, without being so daunting as to be discouraging (e.g., Boaler & Staples, 2008; Schoenfeld, 2014; Stein & Lane, 1996; Stein, Smith, Henningsen, & Silver, 2000).

Teachers also address student diversity in their starting points with respect to task demands. As any class of students is likely to feature a range of current knowledge, experience, and background, teachers differentiate and vary tasks to meet diverse student starting points. Plans then include differentiation of tasks in response to judgments about current student capabilities and understandings.

Further, teachers plan for a variety of tasks to maintain interest and to provide suitable differentiation (Willingham, 2009). For example, history teaching might involve examination of original documents, debate based on a filmed version of historical events, group inquiry projects delving into historical causation and consequences, and whole class discussions aimed at exploring contentious issues. Mathematics teaching would involve engaging students in mathematical practices like developing and using models, reasoning abstractly and quantitatively, attending to precision, mastering the nature of mathematical proof, and making use of structure. High school English teachers would engage students in a range of different literary tasks, with some selected because they speak directly to the lived experiences of students, others so that they expand students' horizons.

Finally, teachers include opportunities for student choice and initiative in selecting tasks. Choice enhances motivation to learn, provides for student agency, and opens prospects for self-determination, pride in accomplishment, and connection to the learning that is taking place.

Closely related to tasks, activities describe what students are doing as reflected in opportunities for participation and in the structure of interactions among teacher and students. An example of an activity structure is the initiate-respond-evaluate (I-R-E) sequence that frequently patterns teacher-student interactions. Activity structures of this kind may characterize portions of lessons or more extended interactions as, for example, the lecture-lab-lecture-lab-exam sequence in many high school science lessons (Polman, 2004). Participant structure (Herrenkohl & Guerra, 1998; Philips, 1972) and activity structure (Lemke, 1990; Roth, McGinn, Woszczyna, & Boutonne, 1999) "describe in-class verbal interactions including norms, roles, responsibilities, physical arrangements and dialogue sequences" (Polman, 2004, p. 435). In contrast to I-R-E and other traditional structures, inquiry-oriented structures engage students in formulating questions, generating hypotheses, explaining thinking, gathering and analyzing data, and reaching conclusions. Similarly, whole class discussions require breaking the teacher-centered nature of the I-R-E to include much more interaction among students with each other. Such structures can take place in science and social studies classrooms, in mathematics, and in text-based interpretation and critique in English classes.

Activity structures then implicate how students are to engage with tasks, which students do so, and where the locus of authority is located. Activity structures are designed to provide

equitable access to intellectual work, aiming at broad and meaningful participation by all students. Structures may orient around cooperative groups, student-initiated and led activities, and others. Authority is distributed across texts, teachers, and students as the class wrestles with interpreting the validity or truth of claims. Teachers design such activity structures to support the nature of the intellectual work and to extend opportunity to diverse students to participate.

Finally, teachers plan for the use of a variety of formats that organize student work. Formats refer to grouping arrangements that support student work through various structures of participation. Groups range from individual seatwork to paired and small group work to full class discussions. Teachers employ and vary such formats in conjunction with their instructional purposes, as a means to differentiate their instruction and to encourage participation, and develop important 21st century skills and disciplinary practices. Teachers plan for the composition of groups to equalize status, to create opportunities for students to be resources for one another, and to support social goals such as teamwork and collaboration in conjunction with academic goals (E. G. Cohen, 1994a; E. G. Cohen & Lotan, 1997).

Particularly in secondary education, teaching is beginning to take place online or in formats that blend online learning with interactions in classrooms. Design principles then will vary depending on the modes through which instruction is offered. Teaching online presents new challenges that require careful design work in advance to support learning at a distance and through technology. This new modality creates its own challenges for instructional design and as more teachers instruct in this manner, they must learn how to design instruction to make effective use of what online and distance learning can afford (see Fishman & Dede, in press).

Instructional design also takes place over various time spans in mind. Teachers draw up designs for a year of instruction or for a course that may last one semester. They also create designs for units of work that may span several months or weeks (e.g., Leinhardt, 1993). Within units they build in sequences of lessons and design individual lessons and even segments within lessons. In coordinating their designs across these time spans, they attend to how the broad goals of learning are worked through at progressively finer levels of detail. And how the main elements of instruction—assessments, grouping arrangements, project plans, estimates of time allocated to content, and others—form a coherent and logically sequenced whole.

Overall, this aspect of planning draws on a broad body of knowledge about the purposes of instruction, the students, and the subject matter. A hallmark of effective instructional design is the coherence among the parts: that the activities are aligned with one another and with the purposes (as these may be oriented to external requirements such as the standards for learning); that tasks and activities form a logical sequence, oriented to such learning progressions as are available; and that instructional materials support the tasks and activities (Danielson, 2013). Designs differentiate instruction along multiple dimensions,

introduce variation, and provide opportunity for student choice and initiative. Above all, such designs provide overall for high levels of cognitive engagement.

Teachers also design with input from their colleagues, special education teachers, guidance counselors, caregivers, and others with knowledge of students that teachers must take into account. Teachers plan for the most part with particular subject matter in mind but they also attend to learning that is cross-disciplinary. For example, designs may integrate learning in mathematics and science, literature and social studies. Multi-subject teachers at the elementary level build this kind of cross-disciplinary learning into their overall curriculum. And secondary and middle teachers may plan with colleagues in subject areas other than theirs, not least in response to what the new standards of learning are calling for in mathematics, English-language arts, and the sciences, which include learning literacy across all content domains and applying quantitative knowledge and skills in contexts other than mathematics class. This is another area for teacher collaborative work as outlined below.

Planning Assessments

As indicated above, assessment is a competency that teachers enact in their planning, in instruction, and efforts to improve instruction. This framework first introduces the planning-related aspects of competence, then the instructional practice of assessment in the assessing and responding to student learning interaction competency, and finally the use of assessment in instructional improvement in the engaging in instructional improvement subdomain. These competencies are of a piece although distributed across the main phases of teaching work. The premise in such division is that assessment competence is influenced by how it is planned, enacted during instruction, and used for the analysis and improvement of instruction. Consequently, teachers' work involves all three of these interrelated aspects of competence. To see how this competency fits into the domain of instruction, please see Table 1.

The practices for planning assessments include the following:

- Planning assessments for a range of goals, some commercially produced, some teacher-developed
- Using assessments that support differentiation of instruction
- Interpreting and using information from a variety of formative and summative assessments
- Interpreting assessments based on the needs of particular groups of students or individual students and regularly modifying them for specific students' needs
- Collaboratively analyzing data with colleagues
- Developing fair and effective policies and practices for assessing and evaluating students

Planning involves assessment of, for, and as learning (Bennett, 2010), as these assessments gauge what students have achieved, help identify how to plan for instruction, and—when used well—are regarded by teachers and students as worthwhile educational experiences. Teachers select, design, and adapt assessments with these three purposes in mind. Further, the SEAL goals for schooling provide a broad range of targets for assessment (Shepard, 2001, 2005). Teachers for example may want simultaneously to plan assessments to gauge mathematics learning and cooperative behavior in groups, civic as well as academic goals, goals associated with growth in students' efficacy beliefs, appreciation for the subject, and others. Teachers plan to assess collective goals but also personal goals for individual students with whom they are working. Teachers, in fact, more often focus on maintaining broader and personal goals for individual students and spend less time driven by the narrow goal of raising mean students' test scores.

Assessments also support differentiation in instruction by identifying the particular strengths and needs of both individuals and small groups of students (e.g., Tomlinson & McTighe, 2006). Assessment plays a critical role in providing the information that links what students know and are able to do with what they need next in their instruction and future schooling (e.g., Supovitz, 2012).

Assessment planning then draws on the backward mapping logic by explicitly identifying the intended outcomes of learning in terms of how they will be assessed (Wiggins & McTighe, 2005). This is set forth in plans for daily lessons and for longer units of instruction and it involves the selection and/or design of a range of assessments including formative, benchmark, common, and summative together with evaluation of student work.

Teachers interpret and use information from a variety of summative assessments, which evaluate student learning at the end of a defined instructional period, whether that is a unit or project, semester or academic year. Teachers use a range of assessments for summative evaluations: quizzes, tests, and final examinations using a variety of item formats (multiple choice, short constructed responses, essays), term papers, portfolios, and performances (McMillan, 2013; Shepard, 2001, 2005, 2006). As previously noted, teachers also adapt these assessments for students' specific needs. Some students might be given more time to complete assessments, other students might have assistive technology to help them complete the assessments.

Assessment planning draws on general knowledge referred to as *data literacy* (Mandinach & Gummer, 2013; Mandinach & Honey, 2008). Data literate teachers make sense of data on student performance, which includes evaluating the technical quality and relevance of the information collected by using their knowledge about the nature of testing, and detecting the limitations as well as the strengths of various assessments (e.g., American Federation of Teachers, National Council on Measurement in Education, & National Education Association, 1990; National Research Council, 2001). For summative assessments, teachers understand the meaning of basic statistical procedures including variability, correlation, percentiles,

norming, and combining scores for grading. This allows them to engage in the systematic analysis of evidence in technically sound and professionally responsible ways.

Assessments produce information about student performance that requires interpretation and professional judgment (e.g., Popham, 2003, 2007). Teachers understand the difference between measuring something and interpreting the evidence, and the role of professional judgment in all formative and summative assessments.

Many of the most prominent assessments in use are required by the state or district; fewer are co-planned by groups of teachers working at the same grade level or in the same content area (e.g., Foster, Noyce, & Spiegel, 2007; Foster & Poppers, 2009). In these cases, teachers use what is already required, but they supplement and adapt such sources to their teaching situations. For example, teachers may study the benchmark assessments required by the district, and map specific questions, probes, and prompts into lesson planning to build up toward the benchmark assessments. Further, because the course of learning among a diverse group of students is uneven and uncertain, teachers continuously plan for the use of assessments to track and support learners at various points along a continuum of learning. In this sense, assessment planning occurs in constant interaction with the course of instruction.

Teachers identify the extent to which assessments are aligned with standards and cover all of the important goals for learning. Then they make such adjustments as called for by their analysis. Teachers interpret assessments based on the needs of particular groups of students or individual students and regularly modify them for specific students' needs.

They also use supplemental assessments to address important learning goals not covered in state and district assessments.

Teachers also design and develop their own assessments—particularly for use during instruction and for goals that have fewer assessments available—to help them better understand what and which students are learning so that they can adjust instruction (e.g., Stiggins, 2005; Stiggins & Conklin, 1992). Such assessments monitor learning on timescales ranging from moment to moment during instruction to summative assessments that cover learning over longer time periods such as the end of units, courses, or the school year. Teachers also are attuned to the use of assessment to aid learning, as when tests and quizzes encourage students to synthesize their learning and extend it to new applications and implications.

Deep knowledge of subject matter is required for assessment planning. Teachers draw on general and basic knowledge about measurement and assessment while also referring to their knowledge of subject matter. For example, working out the next round of formative assessments in an elementary mathematics class requires a deep understanding of the mathematics and the course of learning the particular topics and skills required in the curriculum. Determining how best to assess the development of historical understanding in

an AP American history class requires deep knowledge of the content and of the nature of historical understanding itself. Sound assessment then is subject-specific in important ways while also drawing on general knowledge of assessment practice.

Teachers also plan how to assist students in assessing and self-monitoring their own learning (Stiggins, 2005). Bringing students into the work of assessment is one aspect of helping learners to regulate their own learning. Further, when students work on assessments such as designing rubrics to evaluate their work, such tasks help students learn the content, so that student work on assessment constitutes a useful instructional activity. For example, developing, with students, a scoring rubric for an exercise is itself a learning experience that helps attune students to the qualities of a work product and process (Danielson, 2013). In a mathematics class, for example, it would mean that students would need to be explicit about the differences between formal and informal proofs, between deduction and induction, natural and symbolic language, proof by construction vs. proof by exhaustion.

Assessment planning occurs not only by individual teachers with reference to just their students but also among teams of teachers who may plan for common assessments. For example, the second grade team in a large elementary school develops shared means for assessing science learning at that grade level. Or, cross-grade teams may plan on how to sequence assessments for use across grade levels and student age ranges. At the secondary level, English language arts teachers within a district may plan for common assessments and monitoring tools for that school subject, or even across subjects when planning interdisciplinary experiences. Alternatively, teachers collaboratively analyze test results for their grade levels and schools, identifying specific topics and test questions that bear re-teaching or additional instruction. Here, this competency touches on teachers' capabilities in working with colleagues.

And a final aspect of teacher planning involves their student grading policies and procedures. Here, teachers understand the full range of issues associated with fair and effective assessments, and they create and use assessments with those issues in mind. This includes examining all assessments for possible bias (anything that might be offensive or penalize a group unfairly) and for equitable opportunities to learn what is being assessed. Further, teachers develop assessments and accommodations for taking assessments that are responsive to diverse linguistic backgrounds and individuals with special needs (American Federation of Teachers, National Council on Measurement in Education, & National Education Association, 1990).

Developing fair and effective policies and practices for assessing and evaluating students also entails insuring that all students understand what the learning goals are and how they will be formatively and summatively assessed. This includes providing students with scoring criteria, exemplars and examples, as well as anchors. Teachers assess their students' test taking skills, and they use multiple methods of assessment to minimize error and

maximize making valid inferences (American Federation of Teachers, National Council on Measurement in Education & National Education Association, 1990; Popham, 2007; Stiggins, 2005). Teachers also take care in using assessment appropriately for making valid special education and other referrals.

In sum, the subdomain of planning entails seven teaching subdomains, which we have described above. As noted previously, we see these subdomains in dynamic and fluid relationship with other subdomains and competencies, for teaching requires constant adaptation and responsiveness. Recall also that enacting these subdomains entails the use of considerable professional knowledge and skill, in addition to dispositions that guide teachers in striving for equitable, equally challenging, and responsive education for all of their students. Finally, all of this planning does not take place prior to instruction. Teachers plan some, teach some, replan and refine their plans in a constant ebb and flow as they monitor their students' learning and development.

Attending to Relational Aspects of Instruction

Description and Rationale

The research literature related to this subdomain orients around (a) students' social, emotional, and academic needs and interests, as the fulfillment of these needs influences student engagement and motivation, and ultimately student learning and development (Martin & Dowson, 2009), and (b) the teaching of social and emotional learning as outcomes in and of themselves and as supportive of academic learning (Zins, Weissberg, Wang, & Walberg, 2004). A basic premise is that teachers simultaneously attend to the SEAL goals in mutually supportive and interrelated ways (Payton et al., 2008).

Based on multiple theories of human functioning, the literature identifies a core set of student needs and interests that teachers influence, noting other powerful influences as well, including parents/guardians, peers, and school and community context. The needs receiving central attention include a sense of relatedness or belonging in community (Osterman, 2000); being cared for and known as an individual (Schussler & Collins, 2006; Wentzel, 1997); receiving respect; having autonomy and access to choices (Yoder, 2014); forming positive expectations for one's learning and development (Yoder, 2014); locating connections between school learning and life experiences as conditioned on social and cultural factors such as race, ethnicity, language, and others (Yoder, 2014); and finally, receiving support for risk taking involved in learning (Cornelius-White, 2007; Osterman, 2000; Rolland, 2012).

These needs form a complex nexus of factors that combine to support students' academic engagement and success, while also serving as goals in themselves, part and parcel of the larger goal of fostering positive human development. An important point to note here is that teachers pursue these goals in many contexts and interactions with students, not least in the midst of academic instruction. For example, encouraging risk-taking occurs in a science

class when students are asked to offer hypotheses and explanations for natural phenomena, or in math class when students are asked to support conjectures with reasoning, or in a literature class when students offer alternative interpretations of a poem. But teachers also are alert in other contexts—the playground or lunchroom, for example—where they also interact with students with an eye toward promoting these outcomes.

Social and emotional learning concentrates on prosocial norms, values, and behavior as oriented around empathy for others, effective conflict management, concern and respect for peers, acceptance of outgroups, altruistic behavior, and, intrinsic prosocial motivation (Osterman, 2000, p. 334). These, too, form a nexus of outcomes that serve both as means and ends—means in the context of academic instruction and ends worth pursuing in themselves. When teachers use group work, for example, they instill work norms that emphasize how to manage differences of opinion, how to include all group members in the activity and how to interact respectfully. These goals promote the intellectual work that groups are engaged in while also teaching teach important lessons about values and behaviors that support life in a democratic society.

The relational aspects of teaching also emphasize the development of knowledge, attitudes, and skills associated with recognizing and managing emotions; setting and achieving positive goals; demonstrating care and concern for others; establishing and maintaining positive relationships; making responsible decisions; and handling interpersonal situations effectively (Payton et al., 2008). Students learn how to do these things through direct instruction, simulations, modeling, guided practice, and other methods teachers employ in their efforts to socialize students as individuals and participants in the social life of the classroom and school.

Teachers work on the relational aspects of teaching both through their everyday classroom interactions with children and through specific school-based interventions designed for students with various risk factors (Hamre & Pianta, 2005, p. 949). Teachers provide emotional support for students in ways that weave patterns with other aspects of their teaching. For example, teachers might use cooperative learning techniques, holding students accountable for their performance, create opportunities for choice in the curriculum, interact in a gentle and caring manner, make connections to children's home lives, employ many opportunistic mini-lessons, support risk taking, encourage creativity, and generally set a positive tone in the classroom (Dolezal, Walsh, Pressley, & Vincent, 2003). So while teachers pursue these aspects of their work in planful ways, they also weave their support for students into the ongoing flow of daily instruction. And while investigators have teased out these factors and outcomes in various studies, they are described as nonlinear, recursive, complex, and natural in interactions. By and large, learning unfolds best when learners are well supported and respected, feel pride and ownership in their work, experience some measure of control, learn comfortably from others and experience the classroom as a safe and trustworthy place (McCombs, cited in Cornelius-White, 2007).

The literature suggests that attention to these factors also has effects on several important outcomes that are important for themselves and as mediators of academic learning. One outcome is *self-regulated learning*, a complex construct associated with students' beliefs in their ability to learn, persistence in the face of difficulty, ability to monitor their understanding, regulate their learning and behavior, and the capacity to act in ways that deepen their comprehension (McCaslin et al., 2006; Pintrich, 2000; Walker & Hoover-Dempsey, 2006). Another important proximal outcome is student engagement, defined variously as exhibiting on-task behavior (Dolezal et al., 2003; Raphael, Pressley, & Mohan, 2008), applying mental energy, and/or feeling positively about the class (Cooper, 2014).

We identify three competencies within this subdomain (see Table 1):

- Developing caring and respectful relationships with individual students
- Attending to and promoting student social and emotional needs and learning
- Building positive classroom climate

Developing Caring and Respectful Relationships With Individual Students

Care and respect are fundamental duties that teachers extend to students, which also form the essential basis upon which to build productive learning relationships. There are two primary practices implicated in this competency, as follows:

- Forming and sustaining positive relationships based on understanding students as individuals
- Employing a range of strategies for getting to know students as individuals and in expressing care for them

To see how this competency fits into the domain of instruction, please see Table 1.

Teachers form and sustain positive relationships based on understanding students as individuals (Collaborative for Academic, Social, and Emotional Learning, 2013a, 2013b). All teachers encounter significant diversity among their students, and this competence calls on teachers to respond to children's life experiences in ways that make students feel accepted and cared for (Schussler & Collins, 2006; Watson & Battistich, 2006). Certainly this extends to children living in conditions of poverty, or children from minority backgrounds, or recent immigrants just learning to speak, read, and write English, or children with learning disabilities. But the sources of diversity extend further, to children with single or recently divorced parents, for example, or from families plagued by problems with alcohol or drugs, to children struggling with gender identity, or to new arrivals to a school.

Teachers employ many ways of getting to know their students as individuals and in expressing care for them. This is both an ethical duty (Noddings, 1992) and a basis upon which teachers engage students in academic work (Schussler & Collins, 2006; Watson & Battistich, 2006). When students feel known as individuals, cared for, and respected,

they are more likely to take up schoolwork and to become positive members of the classroom community.

In this work, teachers not only show care and respect, they learn about their students in their individuality. That brings in many individual characteristics that may be salient to student identity and well-being and may require the teacher to gain knowledge about the life experience and circumstances of students conditioned on common factors such as culture, race, and language, as well as on more personal and individual factors. For example, drawing on research in culturally responsive teaching, teacher use a number of activities to deepen their knowledge of their students' lives outside of school, including asking students about their traditions and events in their communities, attending community events, visiting local community centers or churches, taking neighborhood walks with students and/or their families, and doing home visits.

The methods teachers use and the manner in which they show care and respect will vary depending on students' age and grade level, among other factors. A kindergarten teacher with 20 children will enact this competency differently than a high school mathematics teacher with five classes of 25 students. In all cases, effective teachers are attuned to the common and individual needs of their students and work out a basis for gaining knowledge that translates into care and respect. Over time, when teachers stay (and sometimes live) in the same communities, their knowledge of and ties to these communities build up, creating increased social capital, an important resource for teachers.

Attending to and Promoting Student Social and Emotional Needs and Learning

Closely related to the ethic and practice of care are the ways that teachers attend to students' social and emotional needs, including helping students develop knowledge, skill, and dispositions associated with social and emotional learning, including self-awareness, social awareness, self-management, relationship management, and responsible decision making (Jennings & Greenberg, 2009). To see how this competency fits into the domain of instruction, please see Table 1. Below we identify five practices:

- Teaching the skills related to self-awareness, social awareness, self-management, relationship management, and responsible decision making
- Assisting students in developing positive self-concept and sense of efficacy as learners
- Setting firm and fair boundaries for what students may expect from their teacher and from others
- Sharing responsibility with students for promoting social and emotional learning, gradually turning over responsibility to students
- Building connections between students' school and home/community experiences

Teachers directly teach the skills involved, provide opportunities for students to practice such skills and receive supportive feedback, and model the appropriate skills in interactions with students. Teachers might employ specific programs directed to these goals and also pursue them through their daily interactions with students in the context of academic instruction (e.g., Kress & Elias, 2006).

Teachers also assist students in developing positive self-concept and sense of efficacy as learners, encourage risk taking with support, and provide for appropriate autonomy and choice in matters ranging from academic work to social engagements.

Other dimensions here involve how teachers set firm and fair boundaries for what students may expect from their teacher and from others (Cristenson & Havsy, 2004), helping students to understand what constitutes appropriate behavior toward others across a range of situations. This practice includes using language that encourages student effort, supporting students in making wise decisions, the consistent use of cooperative learning and classroom discussions between teachers and students (e.g., Hawkins, Smith, & Catalano, 2004). This competence calls on teachers to share responsibility with students for promoting social and emotional learning, gradually turning over responsibility to students so they learn to regulate their own behavior and monitor it meta-cognitively (e.g., Connell & Wellborn, 1991; Deci & Ryan, 2002; McCombs & Pope, 1994). These behaviors are woven into the fabric of instruction, and there are opportunities for reinforcing and integrating these skills in teaching with other goals, including academic ones.

Finally, teachers build connections between students' school and home/community experiences (Tharp, Estrada, Dalton, & Yamauchi, 2000), both to enliven and make relevant school learning and to validate students' out-of-school experience. For example, a teacher in Alaska might access curricula that make connections between the native Alaskan culture and the mathematics students are learning. This might entail using cultural knowledge about angles and the stars to determine location, direction and distance or teaching probability and environmental science as students study salmon species and their life cycles (Kiska et al., 2012).

Building Positive Classroom Climate

Relational aspects of teaching inevitably invoke social aspects of the work and here cross the boundary into the next major subdomain (establishing and maintaining the social and academic culture), which involves managing the environment for learning. We place this competency here (see Table 1) because the main thrust is to support important aspects of children's social and emotional learning along with academically oriented outcomes. In particular, this competency includes five practices:

- Creating a sense of belonging or relatedness
- Providing appropriate achievement goal structures that emphasize mastery and using performance goals sparingly and selectively

- Promoting positive peer interactions
- Conveying positive expectations for student learning as a broad social norm, for subgroups of students, and for individual students
- Creating a community of learning within the classroom

First, teachers create a sense of belonging or relatedness in the classroom such that all students feel welcome and involved in the social work of learning (Battistich, Solomon, Kim, Watson, & Schaps, 1995; Furrer & Skinner, 2003; Osterman, 2000), especially those who are traditionally marginalized and those whose background teachers may be unfamiliar with. This includes creating environments that are characterized by strong relationships between teachers and students, where students are safe from bullying and violence and supported in taking risks (e.g., Elias, 2004; Zins et al., 2004); and where cultural differences in interaction styles are accommodated. Teachers integrate students from a range of backgrounds into classroom life in ways that help all students feel that they are important and valued class members.

Second, as already indicated above, teachers provide appropriate achievement goal structures that emphasize mastery and use performance goals sparingly and selectively. Orienting too much of learning around competition for external rewards undercuts mastery orientations, while positioning some students below others in ways that are harmful to social learning (Wentzel & Brophy, 2014).

Thirdly, teachers promote positive peer interactions, ensuring that students treat each other with care and respect. They create a nurturing and cooperative environment that discourages behavior that marginalizes certain students and encourages peer support through such activities as morning circle, sharing events, classmate interviews, field trips, and others. Teachers model these values for students, teach them explicitly, create classroom rules and routines that underscore positive interactions, and intervene swiftly to correct anti-social behavior when it occurs. Teachers also use the curriculum to teach about positive relationships, and create instructional routines that support such interactions. For example, teachers set up routines through which students can disagree with one another, listen closely to the reasoning of other students, collaborate in building arguments that rely on multiple voices, and take on various roles in classroom discourse.

Fourth, teachers convey positive expectations for student learning as a broad social norm, for subgroups of students, and for individual students (Hattie, 2009; R. S. Weinstein, 2002). Teachers convey expectations in a variety of ways, including enthusiasm, frequent positive comments, use of wait time, informative feedback, appropriate reinforcement, and encouragement of high expectations from students to other students (Good & Brophy, 2008).

Positive expectations are particularly important in relation to students from nondominant groups, and studies have revealed positive associations between teacher expectations and achievement of low income and minority students (Ladson-Billings, 1994, 1995a, 1995b).

Enacting high academic expectations involves modeling, scaffolding, and clarifying of a challenging curriculum (Morrison et al., 2008). Teachers model unseen or meta-cognitive activities by thinking aloud, encouraging students to collaborate, clearly outlining expectations, and closely monitoring learning. As well, teachers use students' strengths as instructional starting points and demonstrate strong investment and personal responsibility for student success.

Finally, teachers work to create a community of learning within their classrooms. This concept derives from a perspective that conceives learning as, in part, a social process of enculturation (e.g., Bielaczyc & Collins, 1999; Lave & Wenger, 1991; Sfard, 1998; Wenger, 1998). Important practices here involve creating opportunities for students to engage in authentic tasks that supply connection between in- and out-of-school learning (Newmann, 1996), facilitation of student-directed activity, and responsibility both for one's own work and the work of the group. Teachers engage students in activities that build both individual understanding and shared knowledge and skill, as students participate in a variety of roles that shift over time, such that expertise and involvement are distributed, rather than concentrated just in high-performing students.

Here, too, is another point of connection with students' cultural practices, as teachers draw on such practices for learning within the classroom community. For this purpose, teachers seek out perspectives and knowledge held in various communities outside the school to diversify and authenticate the content of school learning (e.g., Gonzalez et al., 2005; Lee, 2007). They may create what Gutierrez (2008) has termed *third spaces* where students construct social and critical literacy experiences and work products. For example, migrant students might write testimonios—critical autobiographies of their own experiences—while engaging in conversation, dialogue, tutorials, comprehension circles, writing conferences, teatro, minilectures, and whole-class discussions (Gutierrez, 2008) in ways that allow them to learn academic content while linking it to their own lives and stories. Further, as the culture of learning involves broad inclusion and the use of student-linked resources, participation in teacher-guided reflective discourse is particularly valuable for ELLs and others with limited exposure to academic language in English (Adger, Snow, & Christian, 2003; August & Hakuta, 1998; Verplaetse, 2008).

Establishing and Maintaining the Social and Academic Culture

Description and Rationale

Teachers encounter students in groups, unlike many other professionals who diagnose and treat clients who come to them individually. This basic fact introduces a powerful social dimension to teaching: the management of groups. This broad subdomain includes practices associated with how teachers create a safe, harmonious, and productive classroom within which learning takes place efficiently, equitably, and to a high standard (see Table 1).

Approaches to this basic subdomain have undergone some significant changes over the years (LePage, Darling-Hammond, & Akar, 1995). On one hand, a large body of research, operating within the process-product paradigm of inquiry, has identified features of classroom management that are reliably associated with student learning (e.g., Good & Brophy, 2008; C. S. Weinstein & Novodvorsky, 2015; C. S. Weinstein & Romano, 2015). This literature provides important leads for this subdomain in teaching, oriented around a behavioral conception of the orderly classroom. On the other hand, as indicated above, contemporary approaches to the social aspects of learning emphasize a new construct—a community of learning—that emphasizes social processes and participation rather than compliance as essential to the ways that teachers create classrooms that encourage ambitious learning (e.g., Bielaczyc, & Collins, 1999; McCaslin & Good, 1992; Vescio, Ross, & Adams, 2008; C. S. Weinstein, 1999).

Classrooms are mini-societies within which teachers establish codes of conduct, rules for carrying out procedures of various kinds, and norms for interaction and behavior. As such, they embody cultures and require governance arrangements. The social constitution of classrooms supports academic objectives and teaches explicit and tacit lessons about ethical, civic, and democratic values and virtues. Teachers establish the social foundations for their classrooms and then gradually inculcate students into the social order so that norms, rules, and routines become automatic, receding from overt attention on the part of teacher and students (Good & Brophy, 2008). Teachers may attend a great deal to these matters at the beginning of the year or the advent of a new class, gradually fading direct attention as rules and norms transition from explicit to tacit forms of thought and action (Bohn, Roehrig, & Pressley, 2004; Leinhardt, Weidman, & Hammond, 1987). Teachers, that is, routinize many aspects of classroom life so that attention is directed to learning. In doing so, they draw from a range of perspectives, including some more behavioral and others more social.

Locus of attention centers both on how teachers treat and respond to students and on how they establish the terms and conditions for how students interact with one another and come to exercise self-regulation with respect to their behavior (McCaslin et al., 2006). There is a strong normative component regulating all forms of social interchange around common and shared values that emphasizes mutual caring and respect for the dignity of all persons; belief that with hard work and diligence all students can learn; allegiance to rigor in learning and in the disciplines of learning; zest, joy, and even passion for learning; and responsibility for one's own conduct and learning. In this sense then this competency is intimately related to teachers' relationships with students and to how teachers establish a community of learning (e.g., Bielaczyc & Collins, 1999).

Not all instruction involves one teacher with a group of students. Nor does it all occur in conventional classrooms; increasingly, teachers engage students in virtual environments in which case the students may be geographically dispersed, attending class in even larger numbers than occur in regular school settings. Teachers engage with students singly and in

groups, inside and outside of classrooms, and via technology that may involve hybrid arrangements combining online (synchronous, asynchronous) and in-person formats. As teachers teach with technology, they master new forms of socialization and enculturation suited to the technologies through which instruction is enacted. Four competencies are associated with this subdomain:

- Implementing organizational routines, norms, strategies and procedures to support a learning environment
- Managing the physical and material environment
- Managing instructional groupings
- Using time productively

A brief description of the associated competencies follows.

Implementing Organizational Routines, Norms, Strategies and Procedures to Support a Learning Environment

Establishing, implementing, and maintaining norms and routines to support learning includes general classroom activities that regulate student behavior as well as activities associated with school subjects. The normative aspects of the classroom are ultimately anchored in a set of widely accepted values, including, for example, mutual caring and respect, responsibility, hard work, and joy in creative work. These values are supported with norms and/or rules for talk among students, passing out supplies, turning in work, activities after work is finished, putting away equipment, and others (e.g., Evertson & Weinstein, 2006; C. S. Weinstein & Novodvorsky, 2015; C. S. Weinstein & Romano, 2015). Rules, norms, and routines will vary by grade level, subject matter, and other situational factors. The age of students will condition the ways in which teachers establish social order in the classroom. Procedures in a first grade class are likely to be different than in an 11th grade chemistry class on such dimensions as the student's role in establishing rules, the teacher's manner in reinforcing rules, and the particular methods teachers use to ensure compliance. To see how this competency fits into the domain of instruction, please see Table 1.

Thus, the practices for this competency include the following:

- Establishing clear expectations
- Establishing and maintaining norms and routines impartially
- Creating environments that support students' special needs

Situational factors also can influence enactment of this competency. Teacher actions at the beginning of the year establish a classroom's constitution, which teachers subsequently reinforce and repair once routines are firmly established. In the many classrooms with culturally diverse students, teachers are sensitive to the relation of cultural norms

regulating behavior and the norms created to manage classroom life (e.g., Gay, 2006; Milner, 2006; C. S. Weinstein, Thomlinson-Clarke, & Curran, 2004). The way teachers use language, address students, and attend to student concerns or discomfort influences effective enactment of the competency. Other student characteristics influencing management include age, special needs, gender, and responsiveness to ELLs (Soodak & McCarthy, 2006).

Studies have identified teaching actions and behaviors aimed at rule and routine-setting. More specific skills teachers may employ here include providing clear expectations and consistently reinforcing these expectations; explicit modeling; stating clear rules and consequences; consistently using praise and other rewards as appropriate; implementing key concepts such as *withitness* (Kounin, 1970); developing norms, rules, and routines sensitively in response to student characteristics; achieving automaticity via explicit directions, cues, reinforcers, and repetition; engaging students in the design of rules and routines; and supporting self-regulation among students with respect to norms, rules, and routines. Such norms and routines are administered impartially without singling out particular students or groups of students.

Regular education teachers also must create environments that support students with special needs, monitor their progress, and lessen reliance on formal identification and designation. One particular approach—response to intervention (RTI)—involves a multi-tier process for the identification and support of students with learning and behavior needs (e.g., Fuchs & Fuchs, 2006). The process involves implementation of high quality instruction for all students with regular monitoring of outcomes and the use of grouping strategies for students who need extra or special assistance followed by targeted interventions with increasingly intensive instruction matched to student learning and behavioral needs. The aim of RTI is to maintain students in the regular classroom, but in cases where progress is not made, to make referrals for special education services as may be called for. Not all districts and schools employ this particular set of routines and processes, nor is RTI implemented in only one way, but the model does enjoy wide use and so serves as one particularly important organizational structure that teachers may use to manage a differentiated approach to instruction that takes into account the special needs of students. Like most instructional approaches, RTI has a limited empirical base and there are concerns about continued misrecognition and mislabeling of students, as well as whether RTI approaches are sensitive to cultural and linguistic diversity (e.g., Artiles, Bal, & King Thorius, 2010). Teachers keep up with emergent research, are aware of the limitations and strengths of various instructional approaches, and exercise professional judgment in their use.

Managing the Physical and Material Environment

Teachers work in a wide array of physical settings, in some cases quite constrained, in others more open and responsive. But all teachers can plan to organize and provision the environment to support lesson goals and formats. Teachers in elementary classrooms, for

example, create spaces for various activities ranging from small group reading circles to activity centers or whole class discussions, art projects and science experiments. Teachers provision their classrooms (often at their expense) with a profusion of print materials, often supplementing required texts. They use wall space for children's artwork and literary output, and arrange/rearrange tables and desks depending on the grouping arrangements they select for certain lesson segments. They bring into the class a wide range of materials for students to use in the context of particular lessons. The classroom's material environment then is an important variable in the teaching-learning equation that teachers plan for in the context of their students, their objectives, and their learning activities.

Physical space and the material environment of the classroom serve a number of functions that include offering security and shelter, encouraging social contact and interaction, enhancing students' identification with the class, providing instrumental support for lesson objectives, providing pleasure, and encouraging growth through both open (e.g., art) and closed (e.g., puzzles) activities (C. S. Weinstein & Romano, 2015). For example, teachers can recruit students to provide artwork and materials that reflect their home environment and cultures. Teachers in Detroit might hang portraits of prominent Blacks in their classrooms while teachers in Southern California might collect children's literature from around the world to represent the 80+ languages of the students in their classrooms. In elementary schools where teachers often use music to create a soothing environment, the choice of music can reflect students' diversity. Putting desks in groups can often support the development of an inclusive environment as it promotes interactions with students who might otherwise be marginalized. Further, teachers consider how the physical environment supports any special needs that students may have, enabling all children to have social and intellectual access to learning. Examples include physical accessibility for students with wheelchairs and technological accessibility for students with sensory impairments. To see how this competency fits into the domain of instruction, please see Table 1.

The practices for this competency include the following:

- Organizing space, materials, and time to support learning
- Preparing students to understand what is required

In these ways, effective teachers organize space, materials, and time to support learning, beginning with careful planning and the assembly and organization of the material and physical classroom environment. They also prepare students to understand what is required, including expectations for student participation and behavior so that transitions between activities and the social spaces in the classroom are smooth and seamless.

Managing Instructional Groupings

Although every class of students is by definition a group, this competency involves the ways in which teachers group students to enhance learning. Teachers use a range of grouping

strategies to support student learning, from whole group discussions to small group investigations, to pair-share arrangements, and individual reading, inquiry, and seatwork. The use of varied groupings is an essential part of a teacher's repertoire, as it allows teachers to accommodate student heterogeneity—in terms of their mastery of relevant knowledge and skill, the time they need to learn specific material, differences in their backgrounds and interests, and differences in their self-concept, motivation, and interest in learning (E. G. Cohen, 1994a, 1994b; E. G. Cohen & Lotan, 1995). In short, the pedagogical use of instructional groups allows teachers to differentiate instruction without creating tutorials for each student. To see how this competency fits into the domain of instruction, please see Table 1.

The practices for this competency include the following:

- Using a range of grouping strategies to support student learning
- Providing well-designed tasks that complement whole or small group work
- Monitoring students' progress on the task and on group productivity and engagement
- Supporting students in learning to take on varied roles across groups

Sometimes teachers put students in cooperative groups in which students with diverse needs and backgrounds work and learn together. Heterogeneous by design, students in these groups might conduct an investigation, peer tutor, or jig saw, delegating responsibility for learning different material to individual group members who then teach it to other class members (Sharan, 1995; Slavin, 1995). Designed and implemented well, these groups improve social competencies, enhance self-esteem, build positive relationships, foster leadership skills, and prepare students for work in adulthood (D. W. Johnson & Johnson, 1989). Cooperative group work has been shown to have positive effects on students' interpersonal relationships in the classroom, to improve students' attitudes toward other students, and to promote conceptual understanding of subject matter (depending on how group work is designed and executed. See Good & Brophy, 2008, chapter 6). Small groups are especially important for scaffolding the inclusion of students who might otherwise be marginalized in large group discussion, including students who receive special education services and ELLs. Research, for example, has demonstrated that ELLs benefit from group work, and teachers utilize a variety of grouping strategies (e.g., elbow partners, corners, clock partners) to promote language learning through peer interactions (Turkan, Croft, Bicknell, & Barnes, 2012).

Instructional groups also vary in terms of their relationship with the teacher. Groups can be assigned to do independent work, teacher-guided worked, or collaborative and self-monitored work. Small groups organized to do independent work can mix individualized work, paired learning, or groups of three or four. Teacher-guided groups are diagnostic and skill-based. Self-monitoring collaborative groups involve group projects or investigations, instructional centers, and often lead to the creation of jointly developed products. While

these groups may be formal, teachers also use informal groupings regularly, asking students to "pair share" or "turn to your neighbor."

While a plethora of labels identify various models for group work, all such groups share a set of common characteristics: (a) the work done in the group is challenging and meaningful; (b) explicit and content-specific criteria are used to evaluate group products; (c) learning goals are clearly understood by students and monitored by teachers; (d) teachers are actively engaged in the groups' work, asking questions, providing resources, and keeping groups on track and task; and (e) classroom norms have been established that support student interaction and productive relationships among group members (Lotan, 2006). Such groups are characterized by individual and group accountability and positive interdependence. Salient features of group learning include collective problem solving, recourse to multiple roles, confronting ineffective strategies and misrepresentations, and building collaborative work skills among students.

Peer-mediated learning is particularly useful in promoting academic achievement, acceptance and friendship, and positive behavior for students with special needs (Fuchs, Fuchs, & Burish, 2000; Fuchs, Fuchs, & Kazdan, 1999; Kunsch, Jitendra, & Sood, 2007; McMaster, Fuchs, & Fuchs, 2006). Dyadic or reciprocal peer tutoring is especially effective (e.g., Fantuzzo, Riggio, Connelly, & Dimeff, 1989), while cooperative learning requires careful attention to all elements of the model (e.g., individual accountability and student reflection on group processes). Teachers model and guide student practice in cooperative group or peer tutoring skills, while building an ethos of acceptance and cooperation in the classroom. Teachers also continuously monitor peer-tutoring processes to ensure their ongoing effectiveness. Peer tutoring is also effective with low-income students (e.g., Greenwood & Delquari, 1995; Maheady, Mallette, & Harper, 2006).

There are also times when it is most appropriate for students to be working alone. Here, too, teachers provide well-designed tasks that complement whole or small group work, monitor students' progress on the task, and provide just-in-time help. Managing individual seatwork entails considerable peripheral vision, as teachers need to make sure that all students are on task while the teacher works with one individual at a time. This also involves knowing when to bring the class back together for mini-lessons when several students are encountering similar problems in their individual work. Teachers may also promote self-directed learning strategies among students with special needs, including attention to cognitive outcomes via use of self-prompting cues, homework completion and quality of assignments. Also, the use of self-evaluations to decrease inappropriate social interactions and to improve and generalize positive behaviors (e.g., pay attention to the teacher, answer questions) through self-monitoring and reinforcement.

To manage these groups well, teachers need to design tasks—both (a) well-structured and routine and (b) open-ended and uncertain—that require a high level of individual accountability for group members, require group members to interact and discuss, and

provide explicit rewards for high group performance. While rote learning is less likely to benefit from collaboration in group work (Pai, Sears, & Maeda, 2014), tasks oriented to ill-structured problems and more conceptual learning gain from well-designed collaborations, as these depend on task conditions and how collaboration is structured. For example, in a science class, when students debate among themselves the reasons (e.g., for the extinction of dinosaurs, student thinking benefits from interaction among members of a team in developing hypotheses, and interactions across teams in challenging and questioning the hypotheses of other groups). Discourse requiring adversarial arguments, for instance, in a science or social studies class, can elicit meta-cognitive talk and dialog that builds cognitive skills (Kuhn, 2015).

Teachers also support students in learning to take on varied roles across groups, including listening, summarizing mini-lessons, clarifying, providing good feedback, and soliciting input. And as students are working in their small groups, teachers monitor group productivity and engagement, and assess how well the groups are meeting the instructional goals of specific activities (E. G. Cohen, 1994a, 1994b; Slavin, 1995).

Using Time Productively

A critical resource for learning is time. Teachers attend to time in a number of ways. Most critically, teachers typically are required to cover a defined body of content within a defined period of time, while the course of learning unfolds unpredictably so that teachers determine when they need to slow the pace of instruction and undertake some reteaching, while still keeping the overall pace on track in order cover the content responsibly. In their planning and lessons, teachers make decisions about who is learning and what is being learned, preteach as needed, and adjust the pace—among other elements of instruction—to accommodate the learning that is unfolding, in terms of academic and social goals, as well as short and long term goals. Teachers streamline noninstructional activity, launch lessons quickly, swiftly direct transitions between lesson segments (such as moving students from whole class discussion into group work; or from a math lesson into a reading lesson); minimize distractions of various kinds; and manage behavior to keep interruptions to the instructional flow at a minimum (e.g., Berliner, 1984; Brophy, 1986; Doyle, 1986; Gettinger & Seibert, 1995; Leinhardt & Greeno, 1986). While efficiency is not the only criterion for judging instruction, effective instruction involves the efficient use of time while understanding that genuine learning is an inefficient process. To see how this competency fits into the domain of instruction, please see Table 1.

The practices for this competency include the following:

- Pacing instruction in ways that balance content coverage with student learning
- Streamlining noninstructional activity and minimizing distractions
- Equitably allocating time with students

As well, teachers consider how to allocate their time with students. Because teachers' attention is finite, while student needs for their attention are potentially infinite, teachers make decisions, again both in planning and during instruction, about which students to devote their attention to at any given moment and over time as instruction unfolds. Time allocations also implicate issues of equity as teachers consider what is most fair in devoting a critical educational resource—the teacher's attention—to particular students and student groups. Teachers consider the ethic of equity in allocating their time to students.

Time management involves several subpractices: pacing instruction in ways that balance the need for content coverage with the actual pace of learning in response to instruction; tracking the allocation of time to subject matter and to students; minimizing distractions and disruptions of various kinds that occur during instruction (Kennedy, 2005); managing transitions of various kinds swiftly and efficiently to minimize time lost to instruction (Doyle, 1986); and carrying out noninstructional duties with dispatch, again to maintain time for instruction. Time management happens on multiple scales simultaneously, as teachers gauge timing for a day's lesson, a longer unit of instruction, and for longer (sometimes year-long) goals often associated with students' social and emotional learning, as well as the development of 21st century skills.

Interactive Teaching

Description and Rationale

This subdomain of competence (see Table 1) encompasses the central tasks of teaching as enacted in educational settings that range from traditional classrooms to virtual environments. The competency calls for teachers to bring three key elements together: (a) ways of engaging students, (b) in relation to students' distinctive learning needs, as focused on (c) the purposes and goals of learning. Because we conceptualize teaching as an iterative, dynamic process, much of what has already been described in relationship to planning applies to interactive instruction, including ongoing adaptation of goals to the needs of one's specific students using ongoing formal and informal assessment.

One line of inquiry, based on a wide-ranging synthesis of research in teaching, has proposed a triarchic model for deep learning in the disciplines (although developed primarily in mathematics; see Kleime, 2012; Baumert et al., 2010). Two of the model's elements—supportive climate and classroom management clarity and structure—have already been described. Here, the third element, which is referred to as *cognitive activation and deep content*, is central. The practices associated with this element include providing challenging intellectual tasks at optimal levels of complexity, accessing and activating student's prior knowledge, and facilitating content-rich discourse.

Teachers activate students' thinking by selecting and implementing challenging tasks; accessing students' prior knowledge and understanding; and using class discussions and activities to generate content-rich engagement with problems, questions, and the challenges

that tasks present. Teachers provide explicit instruction during which they carefully model concepts and skills and provide well-crafted instructional explanations. When teachers encourage students to challenge one another, formulate and defend arguments, evaluate their reasoning (and that of other students), and generalize what they are learning to other contexts and problems, they also provide a climate that is safe and supportive, encouraging intellectual risk taking by students. They scaffold learning, monitor students' contributions for difficulties and calibrate support that advances thinking while maintaining appropriate degrees of student autonomy. Teachers offer opportunities for student exploration, guiding this work carefully, rather than relying on pure discovery methods (Mayer, 2004). Such classrooms also feature a minimum of disruptions and maximal student participation, where teachers are able to maintain order and focus, and make efficient use of time.

This subdomain begins with the goals of learning, particularly as referenced to common standards for learning and to other goals (e.g., SEAL, civic virtues, and 21st century skills), implements the plans teachers make to guide their lessons and lesson sequences, and extends to how plans are revised in the course of instruction, as teachers gauge the effects of their enacted plans on students. Teachers continuously probe for and uncover how well students are gaining understanding and building skills, adjusting instruction accordingly. In this sense, this competency is intimately related to goal setting, planning, assessment, and the continuous monitoring and adjusting that teachers undertake during instruction.

Because content is central to this competency, teachers induct students into the discourse and practices that are used in particular subject matters. They employ a balanced repertoire of discursive practices that range from more teacher-centered to more student-directed or centered. In English class, students offer interpretations of texts and learn the rules for constructing sound arguments. In science class, they learn how to develop hypotheses and what it means to subject those hypotheses to tests of evidence. For states using the Common Core State Standards and/or Next Generation Science Standards, teachers engage students in learning activities that weave together fundamental concepts with disciplinary practices.[5] Engaging students with content then involves helping them learn what kind of talk, thinking and analysis, and activity are associated with building knowledge and skill in particular subject matters (e.g., Hiebert & Wearne, 1993; Kelly, 2007; Knuth & Peressini, 2001; Nystrand & Gamoran, 1991).

Content needs to be set at a level of challenge that connects to students' current understanding and also moves students toward more advanced understanding by providing an appropriate mix of success and challenge. In enacting activities, problems, and

[5] To avoid confusion with the use of the term *practice*, we distinguish between teaching practices (which we describe here) and disciplinary practices, which are the behaviors that students engage in as they learn to think, write, and analyze specific subject matter. Proof is a core mathematics practice, for example.

assignments, teachers attend to differences among students to ensure that the cognitive challenge is optimal (Henningsen & Stein, 1997; Stein, Grover, & Henningsen, 1996).

As already mentioned, student learning progressions are emerging as one critical resources for instructional planning and enactment. Research-based knowledge is beginning to identify such progressions and, where available, these can assist teachers in organizing content and connecting it to the pathways along which students learn. The term *engagement* as used here has several meanings, all of which extend to students (Cooper, 2014; Marks, 2000). One important means of engagement relies on teachers' content knowledge for teaching, including their prior understandings of how students come to know and learn about particular content. In order to engage students, teachers recognize particular common patterns of student thinking in a subject matter domain. And as they become increasingly adept, they are able to anticipate student challenges, misconceptions, partial conceptions, alternate conceptions, strengths, interests, capabilities, and background knowledge. This body of knowledge is potentially extensive and varied as it encompasses many characteristics that students bring into the classroom and is part of a teacher's pedagogical content knowledge.

An important aspect of this competency involves the kinds of common misconceptioins students may have about the academic content. Such misconceptions have been identified in mathematics and science in particular, but in other academic domains as well (see National Research Council, 2000). Such misconceptions may include students' understanding of key ideas, methods of inquiry, disciplinary practices, and ways of participating in the discourse of a subject. Further, teachers also extend such understanding to take into account students' language proficiency, the effects of any learning disabilities, and aspects of student race, culture, and gender as these characteristics influence their grasp of the subject matter.

While knowledge of students' common misconceptions is a useful starting place, teachers extend this knowledge through the methods they employ to probe for and understand how student learning—socially, emotionally, and academically—is unfolding in response to instructional activities. That is, teachers' content knowledge for teaching is constantly expanding as they work with their students in evolving contexts.

Teachers employ a wide range of methods for carrying out these key tasks of teaching. Making content explicit, eliciting student thinking, and providing instructional responses are critical practices that teachers enact in many ways as these are influenced by the goals of learning, the nature of the subject matter, student characteristics, and other factors.

Teachers though do employ specific techniques for teaching content and the literature is filled with proposals and descriptions of particular methods regarded as effective, both generally and within particular subject matter domains. For the most part, this literature, while often persuasive, lacks extensive grounding in well-conducted research that constitute definitive warrants for such methods. But there are exceptions. For example,

research on literacy instruction in the early grades has established some instructional practices with strong warrant (e.g., National Research Council, 1998). When research has established such strong warrants around particular methods of teaching, competency in teaching means critically employing those methods in one's practice.[6]

For example, elementary teachers implement research-based practices in early reading instruction and in other areas of teaching where research-based consensus on best practices has been achieved (National Research Council, 1998). Such practices include the following:

- Direct teaching of decoding, comprehension, and literature appreciation
- Phoneme awareness instruction
- Systematic and explicit instruction in the code system of written English
- Daily exposure to a variety of texts, and incentives for children to read independently
- Vocabulary instruction, including a range of complementary methods designed to explore the relationships among words, word structure, origin, and meaning
- Comprehension strategies that include prediction of outcomes, summarizing, clarification, questioning, and visualization
- Frequent writing of prose (Morrow & Gambrell, 2011; Snow et al., 2005)

Even when using this range of practices, teachers still learn how to adapt them to the contexts and for the particular students they teach. For instance, when working with ELL students, teachers will integrate the use of language games and word walls, especially when the activities are consistent and focus on particular sounds and letters, as research has demonstrated that these work well for ELLs (Turkan et al., 2012; Verplaetse, 2008). Teachers will also engage ELLs in conversations, as that is a major source of children's vocabulary development, and if their caregivers do not speak English, school is a major site for conversations with adults (Turkan et al., 2012; Verplaetse, 2008).

Factors that influence motivation are a critical consideration throughout planning and instruction. Teachers constantly draw upon their knowledge of how to motivate students to learn and persist. This involves challenging students academically in their zone of proximal development (ZPD; Fisher et al., 1980; Vygotsky, 1978), meeting students' social-emotional needs and developing relationships with them, providing opportunities for peer-to-peer interaction and cooperative learning, giving students choices in their learning activities, and, encouraging students through positive verbal praise and, at times, through tangible

[6] This serves as a reminder that this is a living document that should be consistently revised as research accumulates.

rewards (e.g., Brophy, 1999; Deci, Koestner, & Ryan, 2001; Duckworth et al., 2007; Duckworth et al., 2012; Dweck, 2002; Martin & Dowson, 2009).

Finally, as teachers engage students with academic content, they also are mindful of other goals they are pursuing. Certainly teachers strive to impart knowledge, skill, understanding, and even wisdom, as these things apply in mathematics, science, history, literature, and all other school subjects. And, as previously noted, teachers most often integrate these academic learning goals with other goals concerning 21st century skills and social and emotional learning, as both these skills and learning support academic learning and constitute inherently valuable outcomes (Zins et al., 2004).

The competencies involved here are the following:

- Attending to instructional purposes
- Enacting instructional tasks and activities
- Engaging students with subject matter
- Orchestrating productive discourses
- Providing strategy instruction
- Assessing and responding to student learning during instruction

Attending to Instructional Purposes

This competency calls for teachers to enact a set of practices during instruction that include the following:

- Maintaining focus on the purposes for their lessons
- Making clear to students the relationships between purposes and instructional activities
- Communicating appropriate expectations to students concerning the learning goals
- Guiding students in setting appropriate goals for themselves within the context of lesson purposes
- Connecting the purpose of each lesson to the longer term objectives toward which lessons are directed (Grossman et al., 2013; Wiggins & Mctighe, 2005)

To see how this competency fits into the domain of instruction, please see Table 1.

The attending to instructional purposes competency begins in planning clear and explicit purposes for lessons, some of which may be assessed (implicating assessment planning and practice), others of which may be longer term and more difficult to assess, even as they, too, are important. A reading lesson for example may involve quite explicit work on particular decoding skills as referenced to external standards. At the same time, the teacher also seeks to convey pleasure in reading and to promote students' confidence as readers. They might

also be building students' ability to collaborate and to be respectful and caring toward their peers. This practice then calls on teachers to maintain lesson focus on multiple, equally important goals.

Teachers carry out this competency through a range of specific practices that include, for example, posting lesson objectives for each day, tracking student progress toward learning objectives and making this public and transparent, keeping parents and guardians appraised of progress toward learning goals, providing meta-cognitive commentary to students during lessons that continuously key them to what they are learning, and helping students to monitor their own engagement to ensure that lessons not drift and lose purpose.

Other aspects of this competency call for teachers to continuously clarify for students the *why* of their activity, making transparent the purposes of the work students are engaged in. For example, as teachers provide material or hands-on activities in science classes, they focus on the conceptual understanding they are working towards, making clear to students what questions are central to an inquiry, how the activity allows students to experience the nature of scientific inquiry, and how class activities relate to key questions and concepts.

Teacher expectations for student learning are implicated in this competency as well. During lessons teachers communicate expectations explicitly by providing wait time, engaging all students in classroom discourse, using praise effectively, accepting student ideas, giving feedback equitably, making appropriate demands on students, and others (e.g., Good & Brophy, 2008, pp. 47–70).

As well, this competency calls on teachers to provide scope and direction for students to set their own goals within the overall aims of lessons and lesson sequences (CAST, 2011, p. 25). This is an important skill in itself as it also enhances student motivation and engagement. To encourage and direct goal setting, teachers provide prompts and scaffolds to help students estimate effort, resources, and challenge; provide models or examples of the process of goal setting; provide guides and checklists for students to refer to; and post goals and schedules for students to attend to.

Finally, while lessons have coherence around stated purposes, they also are positioned within a larger context that reference external standards and any learning progressions that might be available for particular topics within subject areas (e.g., Corcoran et al., 2009; Daro et al., 2011). Teachers align instruction to explicit sequences of learning objectives that are keyed to students' cognitive development. While the concept of a learning trajectory does not signal some invariant order of learning that defines student understanding, there is empirical support for shorter term, topical development in some areas of mathematics and science, which can inform teacher planning and tracking of lessons. But even when such empirical support is not available, teachers attend in lessons both to the immediate goals and to future relevance as that motivates students and directs their ongoing activity and engagement.

Teachers may adapt their lessons to the pace of student learning and to the needs of particular students. Attending to purposes then requires that the teacher continuously monitor the course of student learning and make needed adjustments.

Enacting Instructional Tasks and Activities

As indicated above, teachers plan tasks that vary in the cognitive demands they place on students. Much of instruction involves routine tasks that are repeatedly assigned to students such as checking homework, think-pair-share, participating in I-R-E discourses, taking notes from lectures, interactive routines for getting the teacher's attention and participating in class discussions, and many others. The emphasis here is on clarity and efficiency in establishing productive routines for certain kinds of academic work in the classroom. But contemporary standards for learning and advances in the psychology of learning recommend that teachers create environments of productive intellectual challenge for students that requires them to engage in novel problems, take risks with their learning, and actively construct understanding. Critical to such outcomes are the nonroutine tasks and activities that teachers design and implement. To see how this competency fits into the domain of instruction, please see Table 1.

Particularly in mathematics but also in science, research has shown that over the course of lesson enactment, task complexity and demand tend to be reduced (e.g., Doyle, 1988; Henningsen & Stein, 1997; Kisa & Stein, 2015; Stein et al., 1996). Consequently, teachers attend to how instructional tasks and activities are supported during instruction to maintain cognitive demand as that relates to instructional goals and purposes. Classroom management issues can disrupt concentration on challenging tasks and activities, so that norm-setting and enforcement are critical. We identify seven practices that are relevant here.

The practices for the enacting instructional tasks and activities competency include the following:

- Setting appropriate tasks that build on students' prior knowledge and understanding
- Scaffolding instruction
- Modeling high level performance
- Maintaining pressure for reasoning, explanation, and meaning
- Assisting students in self-monitoring their performances
- Drawing conceptual connections among ideas that enter the classroom discourse
- Providing appropriate amounts of time for student engagement

These practices begin with teachers' ability to accurately align tasks with students' prior understanding, interests, and motivation. Teachers match task elements to their instructional purposes and to their estimations of student capability and interest (Bennett &

Desforges, 1988). This begins in planning but then carries into instruction as teachers gain feedback from students based on their performance. Instruction often begins with a task embedded in familiar activity, points through discourse to multiple ways of breaking down and accomplishing complex tasks, and allows students to create multiple pathways to results and understanding. Task adjustment is continuous as teachers interact with students around the intellectual demands of the work. In this process, teachers balance the maintenance of high demand with responsiveness to students such that tasks are neither too easy nor too difficult. In heterogeneous classes, this requires differentiation.

Maintaining task demand also involves supporting student performances through scaffolding, defined as the provision of assistance (directly by the teacher, a paraprofessional, or a peer) needed by a student to complete a task they cannot yet work through on their own (Anderson, 1989). Scaffolding then is an instructional practice with broad capability across competencies and it is enacted in many ways. The key though is that such provisions not reduce or eliminate the task's intended intellectual challenge.

Closely related to scaffolding is the use of explicit modeling of thinking strategically about the problem at hand. Modeling of thought processes involves thinking aloud, pointing out information to be sought or gathered, suggesting alternatives, showing how solutions are tested, and others. Teachers engage directly in modeling and they also ask students to model their thinking and discuss how they are working on problems so that both teacher and peer-mediation are involved. Scaffolding and modeling work together to maintain cognitive demand while responding to individual differences among students in their learning (e.g., Fisher & Frey, 2014).

Teachers also maintain high demand by noticing and pressing student thinking (Sherin, Jacobs, & Philipp, 2011). This is based on teachers' capability in noticing salient student responses; interpreting how students approach high demand tasks and whether teacher actions help or hinder students' thinking at a high level; and making connections between specific student responses and broader principles of teaching and learning (Kisa & Stein, 2015). The critical aspect of this practice of noticing entails a shift in seeing teaching as a solo act to seeing instruction as interactional events that include the teacher, student, and task. Attention to student thinking is critical but teachers also are aware of their own instructional actions as these influence student thinking (Tripp & Rich, 2012). Note that this practice associated with maintaining cognitive demand overlaps with how teachers elicit and respond to student thinking as described below. This is another instance of how competencies in teaching necessarily are interwoven.

As teachers interact with students around tasks, they accept partial responses, push students for more complete responses, ask for reasoning and explanation, challenge student thinking by presenting other alternatives, redirect students to other students who may issue challenges and raise questions, and stay with a discussion until central problems and issues have been fully aired and discussed. This practice is related to how teachers hold

high expectations for all learners, pressing them to complete their thinking and their responses to questions and prompts (Lemov, 2010). While students might need different supports to meet high expectations and complete their thinking, teachers do not differentiate by watering down expectations for students who encounter more challenges or who work at a different pace.

Two other practices involve providing students with strategies and procedures to monitor their own learning, and supplying conceptual connections among student ideas toward comprehension of main points, concepts, and explanations. The first of these practices assists learners in self-regulation while promoting motivation. The second outlines the teacher's role in keeping overall track of the discourse around tasks, making connections among student responses that clarify how disparate ideas may relate to understanding and meaning central to the cognitive tasks students are grappling with. Teachers also attend to the joint effects of careful task design and how tasks are socially mediated via collaboration among students. Task and discourse design go hand in hand in promoting learning, and teachers understand how to coordinate tasks with student collaborative activity (Kuhn, 2015).

As well, teachers are constantly adapting instructional tasks and activities to learners. For ELLs, for example, teachers differentiate instruction through literacy development activities (e.g., textual adaptations, visual aids, leveled readers, pair reading) and oral language development strategies (e.g., repetition, rephrasing, summarization) oriented to proficiency levels of their ELLs. Teachers also adapt tasks and activities in response to students' cultural practices and experiences out of school. Lee (2007) recounted linking the cultural practice of *signifying*—a form of Black vernacular English full of irony, double entendre, satire, and metaphor—to a unit on Hamlet. Similarly, Gutierrez (2008) described her use of autobiographical writing to help migrant students develop a sociocritical literacy practice. Gutstein, Lipman, Hernandez, and de los Reyes (1997) described how teachers in an elementary and middle school use their Mexican American students' informal mathematical knowledge as well as their cultural knowledge to teach mathematics to challenging mathematical standards.

Finally, teachers provide adequate time for work on complex tasks rather than truncating them, transforming challenge into routine task completion. Research has shown that time is a critical element to manage and being flexible with timing decisions during task implementation allows teachers to avoid proceduralizing conceptual explorations, or converting high-demand to low-demand tasks (Henningsen & Stein, 1997). Here, too, adaptations are needed to initial plans as teachers adjust to lessons as they unfold.

Engaging Students With Subject Matter

This competency is critical for teachers' competence, as it takes in all of the work teachers do as they engage students with the subject matter. Teachers draw on their knowledge of subject matter together with their knowledge of how to teach particular subjects. As well, teachers adapt instruction to their learners, so knowledge of learner characteristics also is

employed in the enactment of this competency. Other competencies also involve work with subject matter, but here the emphasis is on those teaching practices that are grounded most directly in the content of instruction. To see how this competency fits into the domain of instruction, please see Table 1.

Three practices are associated with this broad competency, as follows:

- Making content explicit in instruction
- Recognizing common and distinctive patterns of student thinking in subject matter domains
- Identifying and implement instructional responses to such patterns of thinking

Taken together, these three practices are highly interactive in the ongoing flow of instruction and by their nature require teachers to continuously adapt instructional moves to students' evolving understanding as they grapple with concepts, questions, and arguments.

The first practice, making content explicit, is critical to providing all students access to the ideas and practices central to the content being taught (Leinhardt, 2001). This requires that teachers be bifocal: keeping one eye on the subject matter and the other eye firmly on the students and how they are understanding and interpreting the content (e.g., Ball & Wilson, 1996; Lampert, 1985). Engaging students with academic content calls for teachers to make such content explicit to students through a range of means that include explanations and representations, models and examples, metaphors and definitions, procedures and hypotheses, investigations and simulations. As this list indicates, there are many methods for making content explicit. Lecture and demonstration certainly count, but so do discussions and experiments, projects and activities (e.g., Echevarria et al., 2004; National Research Council, 2005; Rosenshine, 2012).

Before describing several core strategies, we first note that template strategies are constantly crafted by teachers to fit students' needs. For example, in response to ELLs, teachers adapt instruction by drawing both on specialized linguistic knowledge and skill, and general and subject-specific pedagogical strategies (Bunch, 2013; DiCerbo, Anstrom, Baker, & Rivera, 2014; Turkan et al., 2012). They employ lexical knowledge by identifying the general academic vocabulary used in content instruction, distinguishing core content vocabulary from everyday language, locating specific areas of difficulty, building knowledge of cognates between English and home language, and teaching new vocabulary in context.

Instructional adaptations for ELLs are also content specific and require teachers to have disciplinary linguistic knowledge (Turkan, De Oliveira, Lee, & Phelps, 2014). For example, in mathematics, teachers model and use strategies to ensure that ELLs use and reflect on the discourse of mathematics (e.g., elicitation of deductive or inductive reasoning, using definitions, providing justifications and proofs). In English language arts instruction, teachers find and adapt texts appropriate for ELLs' proficiency levels and use their

knowledge of semantics, syntax, morphology, and phonology as teachers explain sources of sentence complexity and provide examples.

Similar adaptations are made for students with special needs, as well as honing pedagogies so that they are culturally responsive, all with an eye toward specific affordances of certain disciplinary concepts, topics, and practices.

Specifying the particular instructional strategies that teachers need to demonstrate mastery of involves the specifics of grade level, subject area, learning goals, and student characteristics and needs. While we cannot address a comprehensive listing of the pedagogies teachers use to make content explicit, nor list all of the relevant accommodations, we offer a few examples. Here, too, this living document needs consistent revision as new research emerges on instructional effectiveness.

A core pedagogy teachers use involves constructing and offering effective instructional explanations, which entails several subpractices: adapting to learners' knowledge prerequisites, focusing on concepts and principles, and, integrating explanations into learners' ongoing cognitive activities. When constructing an instructional explanation, teachers understand the initiating condition that calls for the explanation (what students know and believe, what their current level of understanding is, how materials has been covered thus far), the devices used in the explanation (which vary by subject matter), and the rules for closure and evidence (e.g., Leinhardt, 1987, 1989, 1993, 2001). Such explanations can be constructed by teachers, by teachers in collaboration with students, or by students, and they entail both explaining an issue or event or idea, and demonstrating how reasoning unfolds in a particular school subject. In this work, teachers make their own thinking visible as they model and demonstrate ideas and procedures for their students.

With ELLs, teachers employ textual knowledge in explaining genres and genre types (e.g., short explications in mathematics, explanations in science, argumentation in social studies). They direct ELLs' attention to different stylistic and linguistic aspects of genres and provide opportunities to use the style required by the genre in the content area.

More generally, in crafting instructional explanations that are culturally responsive, teachers consider analogies, metaphors, and examples that are culturally relevant points of connection. While some of these might come from our knowledge of various cultures (e.g., that Hawaiians use talk story [Au, 1981], or that call response is a cultural norm in many Black churches [Crawford, 1995], or that teenagers love hip-hop), teachers often avoid creating cultural caricatures or stereotypes by getting to know their students as individuals and then using student stories and student discourses to make their instructional explanations responsive. As Noguera (2003) argued, good teaching involves teaching students through the ways that students learn. Good teachers shape their instructional explanations in light of what they know about their students. And as noted earlier, teachers do not caricature their students, but instead understand them as complicated people whose gender and family, culture and religion, background and

experiences all shape—but do not determine—who they are. Thus the need to avoid essentializing students.

Another strategy—explicit instruction—also has several elements or subpractices, including focusing on critical content; sequencing skills logically; breaking down complex skills and strategies into smaller instructional units; starting lessons with a clear statement of purpose and expectations; reviewing prior knowledge and skill; providing step-by-step demonstrations, using clear and concise language; providing examples and nonexamples; scaffolding student learning; giving frequent affirmative and corrective feedback; and providing distributed and cumulative practice (e.g., Brophy & Good, 1986; Gersten, Schiller, & Vaughn, 2000; Swanson, 2001). For other forms of making content explicit—explanations, lectures and inquiry projects, for example—teachers use these skills and others (e.g., Stein & Kucan, 2010).

Explicit instruction is advocated for use with students who have special needs, but care is taken that it not become the sole method thereby reducing engagement with more complex and advanced content and skills. Meta-analyses of teacher-directed practices have indicated relatively strong relationships with certain academic outcomes for students with special needs (Swanson, Hoskyn, & Lee, 1999). Teachers employ both direct and strategy instruction that emphasizes sequencing, drill repetition, and practice-review (e.g., breaking down the task, fading prompts, sequencing short activities, step-by-step prompts), segmentation (e.g., breaking targeted skill into smaller units and then synthesizing back into wholes), directed questioning and responses (e.g., asking process-, content-, and disciplinary-practice related questions), controlled difficulty or processed demands of a task (e.g., sequencing tasks from easy to difficult with only needed hints provided), modeling of problem solving by the teacher, instruction in a variety of small groups, and strategy cues (reminders to use strategies or multi steps, think alouds).

Teachers also understand that the use of instructional explanations and explicit instruction does not replace learners' knowledge construction activities (e.g., Windschitl et al., 2012; Wittwer & Renkl, 2008). Consequently, teachers weave explicit instruction into patterns of activity that involve asking open-ended questions, pursuing student-initiated inquiries, and encouraging student hypothesis generation, argumentation, and critical analysis.

In all such activities, drawing on their PCK, teachers select and use examples, representations, models, explanations, and projects by anticipating where students will encounter difficulties, what ideas will be central (and which will be distracting), how to use academic language appropriately, and when to supply information to keep students on course. Syntheses in a number of subject matter areas emphasize a set of common principles that while generally applicable are especially so for special needs students. These include the provision of authentic tasks, offering instruction in domain-specific learning strategies, and providing opportunities for social mediation and constructive conversations (e.g., Mastropieri & Scruggs, 1995; Scruggs, Mastropieri, & Okolo, 2009). In designing

science inquiries that engages the entire class, a teacher might use peer-led collaborative inquiries (Mastropieri et al., 2006) or have teachers conduct a task analysis of the components of the inquiry, assigning different tasks to students according to their abilities (Browder et al., 2010; Courtade, Browder, Spooner, & Dibiase, 2010). Teachers might use self-instructional materials like knowledge charts to help students guide themselves through the stages of an inquiry (e.g., Jimenez, Browder, Spooner, & Dibiase, 2012).

In sum, in making content explicit, teachers use a wide range of instructional strategies, anchor their decisions in their understanding of the subject matter and of students' understanding and learning. They then engage students in content that is critical, challenging, and rich.

A second practice calls on teachers to recognize common patterns of student thinking in subject matter domains. This practice relies on teacher knowledge of such patterns as these have been identified in research on cognition and learning and discovered by teachers through their experience. For example, a teacher might be preparing to teach about how rocks and soils break down through chemical and physical processes of interaction with the Earth's atmosphere. This involves helping students understand that such weathering can happen through abrasion (rocks rubbing together) or through heat and cooling when rocks expand and contract. Further, chemical process weathering can happen when chemicals in the rocks go into solution or when they combine with other chemicals in the air or water. This weathering takes a long time. However, students commonly think that rocks do not change. They also commonly overgeneralize water's impact on weathering, thinking that water alone is enough to shape rocks. They do not, for example, understand that oxygen in the air is also needed for rocks to oxidize. And they tend to think that the effects of erosion are immediate.

While teaching such material, teachers listen closely for when these kinds of student ideas surface and shape how students interact with the lesson content. Clearly as well, this practice is closely related to how teachers manage instructional discourse and engage in the assessment of learning, particularly in the ways that they elicit student thinking and understanding (see below).

Yet even as teachers are in the midst of instruction, they are taking the temperature of the class and determining next steps. This involves a third practice of responding to student understanding, in a variety of ways, during instruction. Typically, teachers identify next instructional steps, including what questions they might want to ask students to better understand their thinking, what feedback they might give to students, and what reteaching might need to take place for the whole or part of the class. At times, they ask follow up questions that probe student thinking or help students connect their ideas to other students' ideas: "Can you tell me what you mean by ….?" Or "How is that related to what your classmate said earlier?" (Cotton, 1989). Here, too, the use of informal and formal

formative assessments is central, for teachers are constantly rechecking on students' understanding as they move through their planned lessons.

At times, teachers decide that they need to reteach a topic that several or many students do not yet understand. Teachers might use the same materials, or introduce new ones. During reteaching, teachers sometimes regroup students in new ways, adjust their pacing, or the instructional sequence. Reteaching is not repeating, as teachers need to adjust their activities and explanations in light of student difficulties, misconceptions, and questions (e.g., Lalley & Miller, 2006). For example, when one example does not reach all students, a teacher might introduce additional examples closer to students' home culture or personal experiences. They might also draw models to help students visualize a problem, or connect a topic to material the class has already mastered. Gutstein et al. (1997) described how a teacher, Mr. Chamorro, helped his Mexican American students understand the unfamiliar colloquialism *as the crow flies*. After drawing several pictures that helped the students see how ridiculous it would be for the crow to follow the patterns of the roads while flying through the air, he concluded by bringing the point home. "Is the road from Mexico City to El Paso entirely straight the whole way? Is the road distance the same as the actual distance?" The students all said no, and this alternative means for visualizing what the term means seemed to help everyone understand the phrase.

The reflection in action that we describe here is a precursor to the reflecting teachers engage in after a class is over, or while reflecting on how an instructional unit worked out. This illustrates the overlapping, iterative, and dynamic nature of the work of teaching. While it is true that a great deal of reflection happens after the fact, teachers also adjust midstream as they notice who is not engaged, or who has encountered a stumbling block in their learning.

Orchestrating Productive Discourses

Discourse is an important medium through which teachers engage students with the subject matter of instruction. The nature of academic discourse has emerged in the research on teaching as a critically important aspect of effective instruction (Duschl & Osborne, 2002; Langer, 2001; Nystrand, 2006; Resnick et al., 2010; Windschitl et al., 2012), of particular value in teaching reading comprehension to low-ability students (Murphy, Wilkinson, Soter, & Hennessey, 2009). To see how this competency fits into the domain of instruction, please see Table 1.

Three broad practices are involved, as follows:

- Employing multiple participation formats for classroom discourse
- Establishing norms and routines for classroom discourse oriented to particular subject matter domains
- Integrating student cultural practices into classroom discourse

First, discourse formats and strategies range from those that are more teacher-directed or centered to those that are more student-directed or student-centered, and teachers employ a balanced repertoire of discourse patterns along such a continuum (Madda, Benson Griffo, Pearson, & Raphael, 2011). In this sense, discourse is a broad family of formats that teachers develop and use for a variety of purposes (Gallimore, Hiebert, & Ermeling, 2014). Teachers' and students' roles will vary depending on the discourse pattern enacted. Recitation, a common discourse pattern, involves relatively direct control on the teacher's part. Engaging a whole class in an inquiry-oriented discussion involves a facilitating or guiding role. And when setting up group work, teachers describe, model, and reinforce a range of discourse and participation roles that students themselves take on.

I-R-E is a widely used model that is effective for certain purposes (Kelly & Turner, 2009), although it has fallen out of favor, especially as a steady instructional diet. While not counseling the rejection of recitation, contemporary approaches to discourse advocate greater use of discussion-based approaches, in whole or small groups, to promote deep understanding of subject matter among students (e.g., Applebee, Langer, Nystrand, & Gamoran, 2003; Stein, Engle, Smith, & Hughes, 2008; Walshaw & Anthony, 2008), and to provide a better balance of teacher-centered and student-centered discourse.

In addition to ensuring general features of discussion such as participation by all students and directing students to engage with one another rather than entirely through the teacher, studies have uncovered a range of productive moves that teachers coordinate during classroom discussions. These include linking different students' ideas, eliciting such linking from students, pressing students to support their ideas with evidence and to explain their thinking, and revoicing students' ideas (e.g., Resnick et al., 2010; Stein et al., 2008).

When orchestrating an inquiry-oriented classroom, teachers engage in the five particular practices:

- Anticipating what students will do in solving a problem
- Monitoring student work as they approach a problem in class
- Selecting students whose strategies are worth discussing in class
- Sequencing presentations by students to maximize the learning of all students
- Connecting strategies and ideas together to help students understand the content (Cartier, Smith, Stein, & Ross, 2013; Smith & Stein, 2011)

In addition to such general discourse practices, teachers also implement subject-specific practices that draw directly from the norms, routines, and conventions grounded in particular disciplinary communities (e.g., Leinhardt & Steele, 2005; Shanahan & Shanahan, 2008). Teachers fine-tune student thinking through careful attention to the specialized discourse in the disciplines, explicitly drawing attention to key concepts and their meaning in the flow of discussion. Mastering a disciplinary discourse, in fact, is a subject-specific practice and, teachers build students' capability to engage in argumentation that is

distinctive to the disciplines through such actions as verbal modeling of high level performance, making conceptual connections, providing appropriate time for exploring ideas, and sustaining press for explanation, meaning, and understanding. Discussions about proof in mathematics class require a different vocabulary and different questions than discussions about alternative interpretations of a poem in a literature class or an argument in world history. Discussions that entail inductive reasoning look very different than those that involve deductive reasoning.

While there are aspects of these habits of mind that transcend disciplinary boundaries (these are often enumerated in lists of 21st century skills), teachers help students both build on what they have learned in other contexts concerning argumentation, interpretation, and the like, and they help their students engage in discipline-specific discourse. In a history class, a teacher will ask students for evidence in the various texts that they are reviewing—textbooks, primary documents, painting, photographs—and they might explore particular passages. For example, when looking at materials used to teach a lesson on Texas independence, a teacher might ask, "What does the author believe are the Texans' motives?" or "Who is Colonel Juan Seguin referring to when he says 'tyrant's yoke?'" (Reisman, n.d.). A mathematics classroom discussion might involve a teacher asking for students' conjectures. Teachers would use mathematical vocabulary, as in "So, *f* of x is 4x5. What is *f* of zero?" (where *f* is mathematical notation for function). Teachers would ask questions like, "Is this true for all numbers?" Or "Is there a different way to solve the problem?" Reasoned discussion in the classroom involves building accountability to the community, to standards of reasoning, and to disciplinary knowledge (Resnick et al., 2010). Good reasoning then draws on deep knowledge.

Teachers also clarify, establish, and enforce discourse participation rules with an emphasis on teaching for inclusion so that highly articulate students do not dominate the discourse (Walshaw & Anthony, 2008). They differentiate among student responses in ways that both respect what students say—by listening closely and noticing—while also moving student thinking forward. They redirect discussion as needed to ensure that important ideas are being developed, drawing on a range of pedagogical content skills.

Finally, teachers adapt discourse practices to their learners. For example, they design production-oriented activities for ELLs that provide opportunities to express ideas and perspectives in visual, written, and spoken formats. They scaffold ELLs' ability to rephrase and paraphrase academic language during discussion and presentations. And they draw on students' discursive practices in their instruction, using expressive forms such as signifying, rapping, story talk, or call and response to engage students with imaginative uses of language within which students can create as well as reproduce language.

Providing Strategy Instruction

Teachers assist students in a variety of ways with how—as well as what—to learn. That is, they provide students with general and specific learning strategies that students can then employ to guide their own learning. To see how this competency fits into the domain of instruction, please see Table 1.

Specific practices include the following:

- Teachers' modeling of thought processes during instruction
- Scaffolding student thinking
- Encouraging meta-cognitive and self-regulatory processes among students
- Teaching inquiry skills and processes

Strategy instruction provides learners with the tools and techniques that efficient learners use to master new material and skills. Cognitive strategies include taking notes, asking questions, anticipating where one encounters difficulties, and using charts and graphs to help map out a problem. In writing, cognitive strategies including brainstorming ideas, planning, drafting, monitoring, evaluating, revising, and managing the writing process. Research has demonstrated that poor writers do not employ many or any of these skills (Gersten, Baker, & Pugach, 2001; Graham & Harris, 2003), and that students can be taught them.

Certain forms of strategy instruction have been found to be productive with students with special needs. These include a family of procedural facilitators and cognitive strategies in which teachers engage in intensive modeling and monitoring, often involving peer interactions as well (Gersten, Dimino, Madhavi, Kim, & Santoro, 2010). Story grammars and mapping tools are used to promote reading comprehension, text structures to enhance writing. Also in use, elaborated dialogues between teacher and students or among students include explicit modeling of strategies, critical evaluation of written or verbal responses, questioning and elaboration (op. cit.). Teachers also engage in explicit teaching of learning strategies, gradually transferring the learning to the student with the teacher occupying a coach or facilitator role (e.g., Englert et al., 2009).

More specific findings indicate that embedded instruction (teaching of individualized goals within the context of general curriculum) is helpful for certain age levels and disabilities, nonverbal scaffolding (e.g., the use of gestures) is helpful in certain cases, scripted strategies are effective for certain outcomes, and use of concrete-to-representational-to-abstract sequencing can promote certain kinds of learning (Harris, Miller, & Mercer, 1995). Other strategies demonstrated as effective for students with special needs include inquiry-based science (Palincsar, Magnusson, Collins, & Cutter, 2001), activity-based instruction in science (Cawley, Hayden, Cade, & Baker-Kroczynski, 2002), and use of authentic performance measures in assessment (King, Schroeder, & Chawszczewski, 2001).

Teachers also employ a range of pedagogical strategies aimed at advancing ELLs' understanding in the content domains (Verplaetse, 2008). They identify specific roadblocks in texts, adapt materials, break texts into chunks without diminishing rigor, and analyze critical linguistic features to facilitate understanding (e.g. prefix/suffix, antonyms/synonyms, notations, phrasal verbs). They assist ELLs in decoding meaning from abstract and culturally embedded phrases by modeling and guiding students to find and use strategies such as unpacking idioms, creating pictorial representations, or revisiting text to provide context for terms. And they elicit cultural and educational experiences from students to help make connections with content.

More generally, teachers explicitly model strategies for learning by thinking out loud as they demonstrate procedures, work on problems, interpret text, analyze data, and construct arguments and hypotheses. They show as well as tell when guiding students toward desired performances in comprehension of texts, solution of problems, and construction of hypotheses and conjectures, explanations and interpretations.

Ultimately, though, students do the work of learning, so teachers also engage in the work of scaffolding student thinking via the provision of aids that help close the gap between what students currently can do independently and what they can do with assistance of various kinds. In skills-related instruction, teachers may begin with a good deal of scaffolding and then gradually fade supports as students move toward unassisted practice or mastery. Scaffolding takes many forms and may be built into materials teachers use, instructions for group work, patterns of questions during discussions, uses of formative assessments, and others. This practice then is quite rich and varied and teachers employ it in conjunction with their ongoing assessments of student learning for they must gauge what students currently are capable of in order to provide the needed assistance and then continue their assessment along with the gradual withdrawal of scaffolds toward student mastery of skills and concepts.

Metacognitive or self-regulatory strategies include evaluating one's own work or coaching one's self through the solution to a problem (e.g., Paris & Byrnes, 1989; Paris & Winograd, 1990). To help students learn to self-regulate, teachers use various approaches, including direct instruction, metacognitive discussions, modeling, and self-assessment of progress. They analyze personal styles and strategies for learning, and compare them with others. They set appropriate goals that are attainable and challenging, periodically engage students in charting and reflecting on evidence of personal growth, and constantly adapt their approaches given students' progress.

While some research on strategy instruction grows out of a focus on learners with special needs, studies have shown that all students benefit from learning how to plan, monitor, and assess their own learning. Considerable research in literacy instruction has demonstrated the value of strategy instruction and scaffolding (e.g., Center for Research on Learning, 2001; Trabasso & Bouchard, 2002). For example, teachers who use a technique called

reciprocal teaching take turns leading a dialogue concerning a particular text. Students and teachers discuss four comprehension strategies—generating questions, summarizing, clarifying, and predicting—and how to use them to understand specific passages. Teachers initially model how to use these strategies, with a gradual shift from teacher to student as students become more confident and skilled at using the strategies themselves (e.g., Palincsar & Brown, 1984). Some researchers have found that the use of reciprocal teaching can also be culturally responsive, as students gradually take ownership for their own and their peers' learning in cooperative groups (McKinley, 2010). There is a range of approaches to strategy instruction beyond reciprocal teaching, including read alouds, structured notetaking, writing to learn, and graphic organizers. Teachers possess and use a variety of models with their students (e.g., Snow & Biancarosa, 2003)

Finally, teachers also provide instruction in skills of inquiry as these reside in the main disciplines of learning. Inquiry-oriented instruction is called for in contemporary standards for learning in science (see e.g., National Research Council, 2012b), but all disciplines involve methods of inquiry that teachers convey via direct instruction, project-based learning, problem-solving activities, and others (e.g., Reisman, 2012; Schoenfeld, 1992).

Assessing and Responding to Student Learning During Instruction

Teachers use three assessment practices during instruction:

- Eliciting and interpreting student thinking
- Implementing particular methods to check understanding and monitor student learning during and across lessons
- Providing feedback to students

Teachers elicit student thinking in a variety of ways, typically by asking students to talk about a topic that is familiar and/or interesting to them (Heritage, 2013). For example, in understanding what a student might know about plate tectonics, a teacher might ask students where they were during a recent earthquake. Teachers also elicit students' thinking through having them draw pictures, flow charts, or conceptual maps. Teachers modulate their questioning given their goals: questions intended to assess what students are learning are different than those that are intended to spark discussion, prod students to say more or to deepen students' understanding (Cotton, 1989). Teachers use questions to determine students' prior knowledge and understanding, as a basis for subsequent instructional moves. And teachers promote self-regulation by helping students learn how to monitor their own learning against standards and goals that teachers make explicit. This practice overlaps a great deal with practices described above, as teachers often elicit student thinking at the same time that they are managing class discussions, weaving assessing into questioning, which is a core practice in creating discussions in whole classes and between and among students.

Teachers can also elicit students' ideas by having them react to a picture, film, object, or another stimulus designed to provoke their thinking. Formative assessments can be conducted before instruction, during class discussions and interactions, through observing students, or through analyzing student work (e.g., Black, 2013; Crooks, 1988). Teachers can hold assessment conversations that help them informally to gauge student understanding (see e.g., Duschl & Gitomer, 1997); these assessment conversations can be part of class discussions, which accounts for the overlap across the practices enumerated in this competency.

Assessment strategies include posing questions intended to elicit and probe student understanding; using student work to gauge progress; helping students learn how to assess their own understanding (self-assessment and peer assessment); using graphic organizers; conferencing with students individually or in small groups, think-pair-share interactions, exit/entry slips, learning/response logs, and writers' or lab notebooks. When asking questions, teachers use clear language, encourage all students to participate, ask questions with varying degrees of cognitive complexity, and use sufficient wait time to allow for students to think through their responses (Wilen, 1987; Wilen, Ishler, & Hutchinson, 2000). All the while, teachers are considering how to adapt these assessments so that they meet all learners' needs. To make their formative assessments culturally responsive, for example, teachers use contextualized assessment, authentic assessment tasks, and portfolios, constantly examining all assessments for traces of cultural bias in assumptions that are made about what students are familiar with, what they value, and what might be considered common or normal.

Interpreting student thinking requires a full understanding of one's instructional goals: What would complete student understanding look/sound like? What is a proficient response? Accomplished teachers do not judge students' understanding dichotomously (one gets it or does not), but rather see student understanding as dynamic and evolving. Thus, interpreting student thinking involves assessing what aspects of student current understanding are in earlier stages of development. Throughout this process, teachers draw upon their knowledge of student conceptions, of learning progressions, and of the content to be taught as they evaluate the state of their specific students' understanding.

Second, teachers use a range of techniques for checking student understanding during and across lessons, including, for example, think-pair-share, hand signals (e.g., thumbs up, thumbs down), response cards, ABCD whisper (where students draw pictures of their understanding and share them in a zigzag pattern in small groups), clickers, entrance or exit tickets (e.g., What did I learn today?), and circle, triangle, square (thoughts still circling, ideas that are pointed out, or something that squared with one's thinking). Teachers also conduct misconception checks by asking students about typical misconceptions students have, or paraphrase back what a teacher or another student has said, or evaluate themselves on comfort or understanding scales. These strategies provide teachers with immediate feedback on how students are doing, and allow teachers to adjust instruction

accordingly. Whatever particular strategy teachers use, they are typically engaged in the following practices:

- Clarifying, sharing, and understanding learning intentions and expectations for success
- Creating effective classroom discussions, activities, and tasks that elicit evidence of students' learning
- Providing feedback that moves learning forward
- Tapping into students as resources for each other's learning
- Helping students to own their own learning (e.g., Black & Wiliam, 1998, 2012; Wiliam, 2011)

To be inclusive and culturally responsive, teachers often use multiple forms of assessment that tap into varied students' abilities in different ways.

Teachers adjust assessments so that accurate information is collected on all students. Particularly for students with special needs and ELLs, this might include making modifications or accommodations such as employing necessary technology aides, extending time, employing alternate modes of assessment, providing instructions for assessments using different channels (written, spoken), using noise buffers to reduce distractions, translators, and a variety of assessments including performance tasks, visuals, and oral responses (Johnstone, Altman, Thurlow, & Thompson, 2006; Thompson, Blount, & Thurlow, 2002).

Third, teachers continuously provide students with feedback on their learning. Such feedback has varied purposes and takes varied forms, but has proven to be a powerful practice when done well (Hattie, 2009; Kluger & DeNisi, 1996). Teachers understand and communicate the purpose of feedback (descriptive, motivational, evaluative, etc.), the form it will take (written, oral, digital, nonverbal), the timing of the feedback (during a task, afterwards), and the focus of the feedback (to describe qualities of a student's performance or an approach that a student has taken, for example). Feedback usually needs to be prompt and timely, provide clear steps toward improvement, and encourage self-regulation. Further, teachers also provide students with norms and practices in giving feedback to one another that is courteous and constructive.

Giving effective feedback requires that teachers make oral and written comments that are tangible and transparent, actionable, user-friendly, consistent, and goal-referenced. Teachers provide appropriately challenging, reachable, and specific goals. They clarify goals and create a learning environment that prompts students toward the regulation of their own learning. They provide feedback both about a student's progress and how the student ought to proceed (Hattie & Timperley, 2007). Students need to see a clear way toward improvement, and comments need to support their sense of efficacy in making the needed improvements. Research has demonstrated that when provided under the right set of

conditions, praise can lead to higher student motivation (Dweck, 1996, 2002), which can enhance learning.

Engaging in Instructional Improvement

Description and Rationale

An obligation common across professions is to work steadily to improve one's practice and this work is associated with practices that extend from informal reflections to more formal and structured inquiries, work that teachers do on their own and in collaboration with others. In this work, teachers examine their current practice in various ways, determine aspects of their practice they want to improve and then select or create particular improvements that they try out, study, refine, and integrate into their ongoing instruction.

This subdomain (see Table 1) clearly is affected by features of the work environment, including such factors as principal leadership, opportunities for peer collaborations and social networking, efficacy of professional development activities, feedback from coaching and formal evaluation; and others (see, e.g., Bryk, Sebring, Allensworth, Luppescu, & Easton, 2010; Kraft & Papay, 2014; Rosenholtz, 1991). The primary claim is that teachers exercise some measure of control over this competency and that teacher effectiveness over time is in part a function of how skillfully and diligently teachers engage in inquiry and experimentation aimed at instructional improvement.

Research on the development of expertise identifies two patterns of improvement. In one of these, practitioners refine current routines, adapting them to the cases and situations they encounter, yielding more fluid, efficient, and flexible use of such routines. But teachers also study their practice, detect problems, select, create, and try out new approaches, and study the results in cycles of inquiry. Deliberate practice then is required for adaptive expertise and achieving a balance between these approaches is optimal (see Darling-Hammond & Bransford, 2005, pp. 48–51).

The competencies involved here are the following:

- Improving instructional routines
- Engaging in deliberate practice

Improving Instructional Routines

This competency is one form of learning that teachers undertake. They *polish the stone* (Paine, 1990), a metaphor for steadily improving the efficiency and responsiveness of instructional routines. The primary practice here is engaging in individual or collective inquiry into one's teaching. To see how this competency fits into the domain of instruction, please see Table 1.

One formal example of this approach to improvement, borrowed from the Japanese context, is lesson study, a practice that has taken hold in some American schools (e.g., Fernandez & Yoshida, 2008; Lewis, Perry, & Murata, 2006). Lesson study is a large family of instructional improvement strategies with one shared feature: observation of a research lesson by a group of teachers who collect data on teaching and learning and collaboratively analyze it. This model works through the refinement of lesson plans that may be shared broadly as a significant instructional product (Morris & Hiebert, 2011), but also through the development of teacher knowledge, commitment to community, and generation of tools that support collegial learning (Lewis, Perry, & Hurd, 2006).

Another example of inquiry might involve videotaping teachers and scoring their performances with an observational instrument like CLASS. Then teachers receive feedback on their performance from trained coaches, compare particular dimensions to master performances, reteach using the target skills, and repeat the cycle twice per month over the course of a school year. Such work has been shown to result in improvements in student achievement (Allen, Pianta, Gregory, Mikami, & Lun, 2011). Other examples also employ video vignettes to help teachers notice critical aspects of practice. Teachers form video clubs through which they learn to notice and interpret their actions in relation to student thinking and engagement (e.g., Sherin & van Es, 2009; van Es & Sherin, 2008, 2009). Teacher noticing has emerged as a critical practice along with attention to such issues as maintaining task complexity during enactment of lessons (Kisa & Stein, 2015).

The development of routine expertise then constitutes one route to improvement that teachers employ (Darling-Hammond & Bransford, 2005), concentrating on particular skills in their instructional repertoires that they want to refine and improve upon.

Engaging in Deliberate Practice

A second form of improvement, adaptive expertise, involves developing new practices, innovating as well as routinizing practice (Hatano & Inagaki, 1986). The practices involved here include the following:

- Identifying aspects of practice for improvement
- Consulting experts of various kinds
- Using assessments to gather and analyze evidence of student learning
- Engaging in conceptual thinking when using evidence to improve instruction

Associated with adaptive expertise is deliberate practice, which involves a specific set of components that include focusing on a specific practice or skill, identified via analysis of current practice; countering arrested development based on continuing motivation to improve; setting progressively higher goals and performance standards for oneself; seeking challenging situations or problems to work on; and stepping outside one's comfort zone to take risks. Such action sequences are particularly associated with the process of mastering

new practices (see, e.g., Ericsson, 1996, 2005, 2007, 2008). Such work also requires teachers to work through periods of difficulty—the *implementation dip*—when a new practice does not go well initially, but one stays the course toward eventual mastery (Fullan, 1991).

Further, deliberate practice also involves consulting and learning from experts of various kinds (e.g., master teachers, instructional coaches, district and university personnel), and accessing and incorporating research-based practices (see Gersten et al., 2010, for one example).

These elements posit the importance of motivation to improve as a basis for action together with supporting dispositions that include willingness to take risks, confidence to try out new approaches, and persistence in working through difficulties in the course of making changes to practice. Deliberate practice then involves skills associated with reflecting on one's own practice and identifying areas for improvement based on such inquiry. The teacher then selects a particular aspect of practice to work on, engaging in sustained effort toward improvement.

Instructional improvement relies in part on using assessments to gather and analyze evidence of student learning. This requires several subskills: using available qualitative and quantitative data to review what (and if) students are learning the intended content, analyzing student learning and one's instructional practice for where there are problems and disconnects, conceptualizing how the various pieces of information fit together in a coherent whole, and planning or revising instruction based on that diagnosis (Shepard, 2005, 2006; Supovitz, 2012).

When teachers engage in such analytical thinking, they break down their experience into smaller pieces. Using both their own experience in classrooms, and formative and summative data from assessments like running records, student responses to teacher questions and the like, they identify what students currently understand and do not understand; they consider what aspects of their practice may be related to patterns of student learning (e.g., how the design of an instructional task was strong or weak; how the questions used to probe student thinking were well designed or not; how the organization of the classroom inhibited or enhanced students' abilities to interact in productive ways); and they identify new materials and new tasks that might enhance student learning.

Teachers also engage in conceptual thinking when using evidence to improve instruction. Here they step back, consider the big picture, recognize patterns and trends in their students' growth, and draw on various theories, including theories of how students learn specific content, to make conjectures about why students are having trouble with a particular concept. For example, teachers might draw on knowledge of subject-specific learning progressions to understand when their students have difficulties mastering a particular idea. An elementary teacher might use evidence from relevant research on children's understanding to anticipate where students are having difficulties when learning

a particular concept in mathematics or science (e.g., Carpenter, Fennema, Franke, Levi, & Empson, 1999).

Continuous improvement is often conceived as a cycle that begins with problem identification and works through to trial of new practices that are adopted to solve the problem (e.g., Kolb, 1984; Kolb, Boyatzis, & Mainemelis, 2001; Korthagen & Vasalos, 2005). In practice, teachers enter such cycles at various points so the process is not strictly linear. For example, instructional reforms that come to teachers' attention may serve as the source of problem identification. New standards of learning may prompt improvement efforts. And efforts to implement new practices may uncover new and unexpected problems, which in turn launch inquiry. But the model of deliberate practice poses a set of dispositions and practices that generally underlie the development of adaptive expertise, advocated as a hallmark of excellence (National Research Council, 2000).

Teachers often work with colleagues as they improve their practice, and while we situate the improvement of practice within the broad competency directly involving the instruction domain, here, too, the interactive and interdependent nature of teaching competence is apparent, for the competence of professional role—to which we now turn—also involves teachers' collaborative capabilities. This highlights the permeability of the boundaries between the distinctions we have made among and between competencies in this framework.

To summarize, the broad domain of instruction entails identifiable competencies (see Table 1) that can be broken down into subcompetencies and/or practices of different grain sizes. While enacting these practices, teachers draw on knowledge, skills, and dispositions. And while we have described these competencies in a linear, hierarchical fashion, the professional work of teaching is dynamic, iterative, and nonlinear. We now turn to the second broad domain: professional role responsibilities.

The Professional Role Responsibilities Domain

The domain of professional role responsibilities includes the legal and ethical commitments that attach to the role of teachers and their fiduciary responsibility to students, together with the work teachers do with others—family members, other teachers, administrators, service providers—in support of students' learning and development. Fulfillment of these duties is associated with professional comportment, the ways in which teachers enact this set of responsibilities. Professional comportment is both a good in its own right and an instrumental support for teachers' work in the instructional domain.

This domain includes four broad competencies (see Table 1) associated respectively with (a) collaborating with other professionals, (b) working with families and communities, (c) fulfilling ethical responsibilities, and (d) meeting legal responsibilities. See Figure 3.

Figure 3. The professional role responsibilities domain

Collaborating With Other Professionals

Description and Rationale

Teachers engage in a variety of ways with others in their working environments, for a number of reasons. One has to do with the role that school-wide factors play in influencing student learning and development. Teachers cannot simply close their doors and teach under the assumption that they command all of the important influences on their students (studies reveal for example that teachers account for about 1% to 14% of variability in test scores; see American Statistical Association, 2014). Curriculum is a school-wide matter that requires constant planning and coordination within grades, across grades, across subject areas (Jalongo, Reig, & Helterbran, 2006). Teachers design interim and benchmark assessments together, study data on student learning, make decisions about adopting new programs, set common policies regarding grading, absenteeism, behavior in the hallways, and a host of other matters. And school environments, co-constructed through the efforts of teachers and administrators working together, influence teachers' continued learning on the job (Kraft & Papay, 2014). So teachers' work with colleagues is important in relation to the school program whose overall aim is to educate children. Teacher collaboration is associated student achievement (Goddard, Goddard, & Tschannen-Moran, 2007; Ronfeldt, Farmer, McQueen, & Grissom, 2015; Strahan, 2003).

As well, school improvement is recognized as a continuous process or cycle in which teachers gather and examine data, identify problems, devise and implement solution

strategies, and evaluate results (Bryk et al., 2010; Rosenholtz, 1991; Smylie, 2010). Formal activities of this kind are now commonplace in schools, particularly in the emerging era of data driven improvement. Teachers have technical knowledge and skills for this work, including for example broad-based data literacy (U.S. Department of Education, 2010), but they are also skillful in collegial interchanges.

In addition to collaborative work on the many key decisions that are made in schools, a school's culture can either support or undermine what teachers are trying to create in their own classrooms (Bryk & Schneider, 2002; Bryk et al., 2010; Sarason, 1996). Teachers collaborate with others to establish the norms and the values that support school cultures, together with the shared cultural practices that contribute to this aspect of schooling. For example, integrating special education teachers into learning communities supports their collaborative work on behalf of students with special needs. Critical attributes include a common focus on student learning, shared reflective dialogue, deprivatized practice, and regular collaboration (e.g., Louis & Kruse, 1995; McLaughlin & Talbert, 2001).

Then, too, teachers often mobilize supports for their students that require expertise from others. Inclusive education calls on teachers to integrate students with special needs into the regular classroom. Further, students with this designation may also be ELLs and come from a range of social, racial, and ethnic backgrounds, requiring teachers to learn about how multiple factors come into play in the lives of students. Educating special needs students in typical classrooms is now widely accepted as the least restrictive environment within a continuum of placements. Often in this practice, teachers work in the classroom with special education paraprofessionals or special education teachers in consulting or coteaching arrangements. Students with disabilities who have IEPs on file that the regular teacher typically has joined in developing, may spend all or a portion of their time in the regular classroom. The teacher then implements those accommodations and modifications called for in the plan with the overall goal of integrating special needs students as full members of the learning community within the school and classroom. This work requires close coordination with other professionals and with families.

Being good stewards of child welfare requires that teachers consult with social workers, nurses, special education personnel, and others to ensure that children are identified and provided with the services they need. Through collaborations teachers secure, coordinate, and often implement learning supports (e.g., Borders & Drury, 1992; Giangreco, Edelman, Broer, & Doyle, 2001; Jones & Bender, 1993). This may be the support of a co-teacher who has special education expertise or the support of an occupational therapist for a student with a wheel chair. Or it might be assistance from a technology expert, a school counselor, or a paraprofessional. Collaboration is critical then in the ongoing provision of programs and services to children.

As well, much of teaching work beyond the classroom requires engagement in the school and district. Schools create a range of formal opportunities and structures that involve

teachers in needed roles and functions with other teachers, other professionals, and community resources.

Equally important is teachers' informal work with colleagues. They discuss best strategies for reaching certain students, engage in peer observations, co-plan assessments, work on special projects and activities, and share curricular materials. Collaboration then engages teachers across a continuum of activity from formal roles to informal experiences, often drawing on knowledge and skills associated with the creation of authentic communities of learners (McLaughlin & Talbert, 2006; Supovitz, 2002).

Schools also require teachers to become leaders as contemporary conceptions of leadership stress its distributed nature (Firestone & Martinez, 2007; Spillane, 2006), whether around formal or informal roles or functions. Leadership no longer is the sole province of administration but rather a shared responsibility if a school is to be effective, and this calls for teachers to develop leadership capabilities involved in work with other adults. Skills of clear and timely communication, teamwork, conflict management, strategic planning, and others come into play as teachers work on the school's instructional program (Mangin & Stoelinga, 2008; York-Barr & Duke, 2004).

Finally, collaborating with other professionals is simply a requisite aspect of becoming better at teaching. No teacher—regardless of experience—knows it all. Teachers continue learning on the job, and they do so not least by working with their colleagues (Little, 1990, 2003). So-called spillover effects, hypothesized to occur via teacher-to- teacher learning are associated with student achievement (e.g., Kirabo Jackson, & Bruegmann, 2009). Such work requires practices built on mutual respect, recognition and use of each person's expertise, and transparency around one's own practice.

Four core competencies are associated with the collaborating with other professionals subdomain:

- Using professional networks
- Communicating professionally, both in person and via technology
- Participating in teacher learning communities and teams
- Exercising leadership, both formally and informally

To see how this subdomain and competencies fit into the domain of professional role responsibilities, please see Table 1.

Using Professional Networks

A good deal of teachers' work outside the classroom involves participation with peers; teachers' engagement in networks has been shown to mediate their instructional improvement efforts (Coburn, Russell, Kaufman, & Stein, 2012). Teachers interact with peers to support instructional improvement and access to innovations that offer promise of

improvement (e.g., Atteberry & Bryk, 2010; Coburn, Choi, & Mata, 2010; Frank, Zhao, & Borman, 2004). The depth and breadth of teachers' engagement in peer support networks assists teachers as they learn new practices and manage the complexities of change efforts. Networks supply both technical assistance and socio-emotional support for the demanding work of change.

Teachers create professional networks that support their instructional improvement efforts and that provide access to services for their students. Service providers may include special education teachers, nurses and social workers, instructional coaches, curriculum coordinators, and others at both school and district levels. Sometimes, too, teachers need to reach out beyond the school to enlist law enforcement, community service workers, employment counselors, and others who provide assistance of various kinds. High school teachers may be particularly engaged in supporting post-secondary plans for students. Elementary teachers help discover what each student needs—eyeglasses or asthma medicine, breakfast or friendships with peers. Here, the task is to identify student needs and then provide access to services that meet those needs. Teachers who are adept at identifying student needs of all kinds have a store of information about who might be of help and skills at tapping into those resources. Networks are crucial. If they do not know, they find someone who will.

Networks are also essential to teachers' ongoing professional learning. Teachers attend professional meetings, build alliances with other teachers in their school, community, state, and nationally who are pursuing similar projects. Increasingly, teachers access these networks for just-in-time support and for finding ways to enhance their students' learning and development.

The practices entailed with this competency include the following:

- Extending help-seeking and help-giving to relevant colleagues
- Tapping collegial expertise in learning new practice
- Developing fund of professional resources to meet student needs
- Observing norms of reciprocity, openness, and inquiry in inter-professional relationships

To see how this competency fits into the domain of instruction, please see Table 1.

Communicating Professionally, Both in Person and via Technology

Teachers engage in a broad range of communications with other professionals and must become adept at managing various forms of communication from face-to-face interactions, telephone conversations, emails, blogs, and other digital forms. Communication also involves knowledge about how best to listen, comprehend, persuade, and engage in other

aspects of the communicative process as structured around various purposes with various others (Earl & Timperley, 2009).

A critical capability here involves developing communicative competence cross-culturally when that becomes necessary, as teachers work with other professionals (and families, see below) from diverse backgrounds. School faculties, for example, may include teachers from a range of social, racial, and ethnic backgrounds that call forth understanding of how cultural factors influence social relations and communications. Teachers must develop sensitivity to such factors in their collaborative work with others. Just as they constantly adapt instruction to students' needs and backgrounds, teachers adjust their communication to differences in language and cultural norms to better connect with parents, caregivers, other teachers, administrators, and community members.

The practices involved with this competency are the following:

- Developing facility with range of communication formats
- Attuning communication to relevant cultural norms

To see how this competency fits into the domain of professional role responsibilities, please see Table 1.

Participating in Professional Learning Communities and on Teams

Teachers also work on teams organized by grade level or department, within or across schools, oriented around various tasks and duties. These groups are important sites of ongoing teacher learning (e.g., Little, 2002; Mundry & Stiles, 2009; Ronfeldt et al., 2015; Stoll, Bolam, McMahon, Wallace, & Thomas, 2006; Supovitz, 2002), and there is a growing research base that suggests participation in these communities can lead to increased teachers' knowledge and instruction (Fulton & Britton, 2010), extending to modest effects on student achievement (Lomos, Hofman, & Bosker, 2011). To participate in such communities, teachers require skills associated with effective participation on teams, progressing increasingly to leadership roles and activities. Teamwork has been analyzed as a critical (often evoked as a 21st century) skill for many kinds of work involving skills like listening, questioning, sharing, persuading, helping, and respecting. When teams are well-managed via common protocols of work within aligned systems of curriculum and instruction, there is at least limited evidence of positive outcomes (Saunders, Goldenberg, & Gallimore, 2009). Critical, too, are skills associated with the mediation and resolution of conflict because disagreements about many matters arise in the work of teams (Achinstein, 2002). Such conflict can be productive, and false consensus can be the enemy of improvement. Often, sharpening conflict can be a productive move in identifying the underlying issues that are at stake. This competence then references how teachers work with other adults on matters related to curriculum, assessment, and instruction; school improvement processes; the management of change and innovation; and the creation of

inclusive professional community in the school that integrates teachers across departments, specializations, and student populations.

The practices entailed with this competency are the following:

- Engaging critical skills of listening, questioning, sharing, persuading, helping, respecting
- Managing and mediating conflict toward productive consensus
- Identifying problems and proposing solutions for consideration
- Observing norms of inclusiveness, openness, sensitivity to others
- Exercising leadership in group processes

To see how this competency fits into the domain of instruction, please see Table 1.

Exercising Leadership, Both Formally and Informally

Leadership in schools is a distributed function (Spillane, 2006; Spillane, Halvorsen, & Diamond, 2001), not bound to particular roles. All teachers exercise some leadership in relation to some matters at some times of the year and at certain phases of their careers. As teachers gain experience and expertise, they progressively take on leadership responsibilities. This can be done formally, as when a teacher agrees to chair an important committee, or informally when a teacher provides expert guidance to a working group within the school. Leadership also may be associated with informal specialization, as teachers make decisions about aspects of their practice they particularly want to improve upon. A teacher might become adept at using technologies of various kinds and so serve as a resource for other teachers. Or master the details associated with valid and reliable interpretation and use of test scores, assisting the school with data analysis.

The range of roles for teacher leaders is expanding. They can be coaches and mentors, learning team leaders, collaborating teachers in teacher residencies. They can lead curriculum work, be professional development staff, or association leaders. This competence then is enacted in myriad ways by teachers, and schools and districts succeed in large measure based on the quality of teacher leadership. While the concept of teacher leadership requires greater specification and development, it has emerged as a critical aspect of teachers' work in the 21st century (York-Barr & Duke, 2004).

The practices of leadership, while drawing upon a teachers' instructional competence extend beyond working with pre-K-12 students, and thus require the development of specific competencies, including working with adult learners, communicating and collaborating effectively, and systems thinking (e.g., Barth, 2001; Council of Chief State School Officers State Consortium on Education Leadership, 2008; Crowther, Kaagen, Ferguson, & Hann, 2002). For example, teacher leaders know how to foster a collaborative culture, access and use research to improve practice, promote professional learning for

continuous improvement, promote the use of assessments and data, facilitate instructional improvements, improve collaboration with families and communities and advocate for students (see Teacher Leadership Exploratory Consortium, n.d., for explication of these competencies).

The practices involved in this competency include the following:

- Developing and sharing specialized expertise
- Taking on formal and informal leader roles

To see how this competency fits into the domain of instruction, please see Table 1.

Working With Families and Communities

Description and Rationale

Teachers open and maintain regular, two-way communication in order to help families understand the instructional program; work with them to support a student's specific progress; and engage them in learning activities aligned with the instructional program (Miksic, 2014). These communications reference students' academic, social, and emotional development; engage families proactively in supporting such development; foster two-way communication based on respectful listening; and draw on cultural and linguistic sensitivity to diversity among families and within communities (Gallego, Cole, & Laboratory of Human Cognition, 2001).

Particularly at the elementary level but continuing through adolescence, teachers' effective engagement with families provides a vital support for students' learning and development (e.g., Sénéchal & Young, 2008). Family involvement supports students' efforts in school, provides teachers with critical information about students, and mobilizes additional resources for learning via the many ways that families can become engaged in academic and other activities with teachers and schools (Kratochwill, McDonald, Levin, Scalia, & Coover, 2009). Research has demonstrated a positive link between forms of family involvement and student achievement (Bryk et al., 2010; Dearing, Kreider, Simpkins, & Weiss, 2006; Epstein, 1991; Gelber & Isen, 2011; Houtenville & Conway, 2008; Jeynes, 2012; Van Voorhis, Maier, Epstein, Lloyd, & Leung, 2013), although how parents are involved matters. For example, parents may support children's autonomy, monitor work habits, and express enjoyment and care about children's school experiences. Alternatively, they may be controlling, critical when checking homework, or irritated by having to talk with teachers (e.g., Pomerantz, Moorman, & Litwack, 2007). Teachers can be alert to socio-economic and other differences in parents' mediation of school learning (e.g., Calarco, 2014), and assist parents in providing needed supports for learning, both with respect to skill development and motivational aspects of learning (Grolnick & Slowiaczek, 1994). Further, research has shown that active forms of parent involvement are beneficial not least for socioeconomically disadvantaged

youth, with Latino and Black children benefitting from parents who reach out assertively to teachers and request particular teachers for their children (Robinson & Harris, 2014).

Teachers' involvement with families is a valuable context for demonstrating essential caring and respect for students and their families, particularly around the many forms of diversity associated with children, families, and communities today. And as teachers come to learn about the community, so it becomes a rich resource for connecting the instructional program to children's home-lives and out of school circumstances and interests (Edwards, Pleasants, & Franklin, 1999; Gonzalez et al., 2005).

The issue of cultural competence in regard to engaging with parents and guardians is of particular import in schools serving marginalized populations as the students in such schools are more likely to have negative school experiences that can be addressed in part by engaging parents in positive and supportive ways (Delgado-Gaitan, 1991).

Productive partnerships between teachers and parents rest on the exchange of information such that teachers gain a deeper understanding of the family's resources and interests, while parents gain a deeper understanding about the school, the classroom, and actions they can take to support their children's learning. Effective outreach efforts are based on teachers' understanding of the cultural practices in particular communities and the most effective ways of communicating with families. And teachers assist parents, for example, by focusing on particular types of literacy practices that parents can help in developing (Paratore & Edwards, 2011) or introducing parents to new mathematics concepts through programs like family math.

Teachers then understand the purposes for communicating with parents and for learning about the communit(ies) from which their students come. These purposes include (a) informing families about the instructional program, (b) enlisting families in support of the program, (c) engaging family and community resources and assets to support the program, and (d) engaging families around the academic progress and socio-emotional development of individual students.

The knowledge in use here also implicates self-knowledge as relates to sources of bias, stereotyping, and misunderstanding that may interfere with teachers' communications with families. Teachers can harbor a range of misconceptions and misunderstandings about family involvement in general and about specific parents, guardians, and families. These biases may have roots in race and ethnicity, language and culture, family structure and social class. An important part of involving family then relies on acquiring knowledge that counteracts and overcomes bias while setting the terms for positive and productive relationships.

Two core competencies are relevant here:

- Fostering two-way, respectful communication with parents and guardians
- Using family- and community-related information as a resource for learning

To see how this subdomain and competencies fit into the domain of professional role responsibilities, please see Table 1.

Fostering Two-Way, Respectful Communication With Parents and Guardians

Teachers exchange information with parents and guardians in a variety of ways on a variety of matters. Communication typically includes telephone calls, emails, texting, class newsletters and websites, home visits, written comments on report cards, in-person conferences, and at school events attended by parents and guardians. Communication may include information about the class, the curriculum, and school-wide matters and about each family's individual children and their progress in school.

To enhance communication, teachers learn about the circumstances of their students' families and tailor communication strategies to those circumstances. Low income families may not have access to email; limited English speaking families may need assistance in translating and understanding communications from school; working parents or single parents may have restricted opportunities to visit the school. The thrust of this competency then orients around the work teachers do to understand the nature of the community served by the school so that communications can be tailored to the needs of families in a range of circumstances, not least to include families with special needs students and their involvement in the IEP process (Turnbull, Turnbull, Erwin, & Soodak, 2006).

The teacher's role is not only to inform families about the school and about their children's progress; it is also to listen and learn from families in ways that support the educational mission and students' progress (Honig, Kahne, & McLaughlin, 2001; Edwards et al., 1999). The emphasis on two-way communication indicates a posture of respectful listening to better understand the circumstances of children's home lives and how the teacher and the school may better serve the student.

The practices involved here include the following:

- Conveying information to families clearly, accurately, comprehensively
- Eliciting and interpreting information from families accurately and empathically
- Managing interactions with families sensitively and responsively
- Identifying and implementing effective responses to problems, issues, and concerns

To see how this competency fits into the domain of professional role responsibilities, please see Table 1.

Using Family- and Community-Related Information as a Resource for Learning

This competency focuses on a particular purpose for home-school communication, which is to provide information that teachers draw on as a learning resource. Here, the emphasis is less on making school learning relevant, than on making cultural resources available as objectives of and for learning (De Gaetano, 2007). While the former practice draws *in* knowledge of the community to support school learning, this practice draws *on* knowledge of the community as a resource for learning. Teachers create funds of knowledge (Gonzalez et al., 2005) about cultural practices that serve as learning experiences for students, supplementing, complementing, and amplifying the school curriculum. Further, teachers draw on their knowledge about how best to engage parents/guardians in supporting the learning process at home. Moll and colleagues (Moll, Amanti, Neff, & Gonzalez, 1992) demonstrated the importance of communities of learners within large cultural and familial networks, arguing that the integration of these local funds of knowledge into classroom instruction forges strong links between parents, educators, and children, and the validation of this knowledge allows families to bring more to their children's education.

This competency calls on teachers to be culture workers, acquiring knowledge about the community and the families living in community that their school serves, as this knowledge can be integrated into the curriculum (Gutierrez & Rogoff, 2003). Clearly this practice will be specific to particular communities but general guidance involves the two steps of gathering information and then working it into the curriculum. Teachers can engage students themselves in this work, learning directly from them and having them gather information formally and informally as potential learning resources. Here again we see the permeability of the boundaries between and among the competencies described in the framework. Clearly teachers' ability to engage in these professional activities shapes and is shaped by what happens in their classrooms when they are interacting with students, assessing students' understanding, tapping into students' experiences, and adapting instruction.

The practices involved with this competency involve the following:

- Building local funds of knowledge
- Employing funds of knowledge for relational and instructional purposes

To see how this competency fits into the domain of professional role responsibilities, please see Table 1.

Fulfilling Ethical Responsibilities

Description and Rationale

Teaching has long been regarded as an essentially moral undertaking (Hansen, 2001). The moral dimensions of teaching call on teachers' manner or dispositions but also on their knowledge, understanding, and judgment, intersecting therein with competence. This aspect

of practice centers on the ethical duties attached to the office of the teacher (Buchmann, 1993) and to the code of conduct associated with teaching as a profession (Green, 1985; Terhart, 1998). The basis for such duties is fiduciary. Teachers are entrusted with the welfare of children whose attendance at school is compulsory. Children's welfare includes their academic, social, and emotional well-being now and in the future as influenced by their school attendance. Teachers know and understand the basic ethical principles that bind teaching, and they exercise judgment and diligence in abiding by these principles. Twin ethics of care and justice undergird the duties of a teacher that require judgment in application, often judgment calls in the face of inevitable ethical dilemmas, as basic principles may clash in particular situations (e.g., Kidder & Born, 1999; Strike & Soltis, 1992).

The call to care for students is enacted in a range of ways (Perez, 2000). Practices such as modeling, dialogue, and confirmation rest on teachers' genuinely knowing the students they teach. They acquire and draw on awareness and appreciation for cultural differences and social diversity, especially among their own students, treating diversity as a resource in instruction. Further, they undertake responsibility for their students' learning and development, including efforts to identify and help students to overcome obstacles to attaining success (Noddings, 1988, 1992). In their moment-to-moment interactions with students, they are *tactful*, in the sense of being attuned to students' immediate needs (van Manen, 1991) and they treat their students with respect, particularly as and when this requires cultural knowledge and understanding.

The call to be just and fair requires that teachers ensure equitable access to learning opportunities, where *equitable* is associated with the principle of justice, to each according to their needs. This means that teachers differentiate their responses and actions based on their understanding of the needs of diverse students (Strike & Soltis, 1992). The nature of teacher responsibility for students shifts with the age of students, where younger students require different forms and kinds of care than older students. Issues of care, fairness, tolerance, and expectations can be culturally laden, and teachers are aware of this in the relationships they establish and maintain with students and families (Banks & Banks, 2004, 2010). In part, this entails learning the meaning of these values and virtues in the contexts in which teachers work.

Consonant with a professional code of ethics, teachers act, in their relations with students, parents, colleagues, and administrative superiors, with honesty and integrity oriented around students' well-being for whom they serve as advocates, even in situations where such advocacy may create conflict or criticism. *Putting children first* serves as a fundamental axiom for teaching.

To represent the welfare of students, teachers know their students and are aware of any biases they may have in relation to particular student characteristics. Much of this they learn through their direct work on instruction—in planning, nurturing the relational aspects of teaching, and adapting instruction to their students' needs. Then teachers

proactively detect and correct these biases via systematic reflection and inquiry through which they solicit accurate feedback from students, parents, and other teachers. These are specific skills honed in service to teachers' fair and caring treatment of students.

Somewhat similar skills attend adhering to an ethical code of conduct together with forming a professional identity around basic values of honesty and integrity in relating to others. Again, knowledge of specific ethical responsibilities is critical in establishing the minimum requirement. Beyond knowledge, teachers know how to resolve ethical dilemmas of various kinds in the application of core principles to particular situations of practice. Student welfare is one guiding principle but teachers also model and instruct students in the scholarly virtues as represented in the disciplines of learning (e.g., Goodlad, Soder, & Sirotnik, 1990).

Finally, advocacy is a distinctive subskill. At times, teachers must speak truth to power on behalf of their students, when rules are misguided or others have ignored the appropriate rules. Advocacy involves discernment in situations that come up, but also something more: the courage or conviction to stand for what is in the best interests of the student. However difficult, this is an ethical imperative in teaching.

While students constitute a primary touchstone for ethical responsibilities, subject matter also is implicated. Teachers must be faithful to the canons of disciplinary knowledge. They must understand and represent for students disciplinary virtues associated with the spirit of inquiry, the uses of evidence to support opinions and hypotheses, open-mindedness in considering ideas and perspectives of others, and related values (Ball & Wilson, 1996; Lampert, 1990; Strike, 1990). Teachers are loyal to their students, to the subjects they teach, and to the ethical dimensions of interaction between the two.

There are four competencies here:

- Enacting the basic ethical principles and duties associated with the role of teacher and exercising diligence and prudence in observing these duties
- Reasoning wisely through ethical dilemmas
- Detecting and correcting biases of various kinds
- Advocating appropriately for students

To see how this subdomain and competencies fit into the domain of professional role responsibilities, please see Table 1.

Enacting the Basic Moral Principles and Duties Associated With the Role of Teacher; Exercising Diligence and Prudence in Observing These Duties

The first requirement here is to abide by teachers' moral responsibilities to students. The duty to care and to treat children fairly according to their specific needs and characteristics is basic to teaching. This injunction does not mean treating children equally, in all instances,

but equitably, such that teachers take into account relevant differences among students that they must be responsive to. More than one principle comes into play in teachers' treatment of students, and teachers should be able to articulate the relevant principles and how they apply in teaching situations (Colnerud, 2006). This requires teachers to draw on their familiarity with the basic moral precepts of teaching as an element of competence, forming the cognitive basis for ethical behavior toward students (Fenstermacher, 1992).

Teachers have a special duty to assume responsibility for their students' learning and development. Enacting this duty requires judgment because teachers share responsibility with students themselves and with other professionals who also are charged with this responsibility. This means that teachers inculcate responsibility for learning in their students as part of their responsibility to them. And this means at times allowing students to flounder or fail, as this can teach important lessons students must learn. But teachers also exercise diligence on behalf of all their students, doing their utmost to promote learning in every student. There is a fine line here that this competence calls for: to strive on behalf of students and to instill striving in students in the course of which students are allowed to falter, to try again, and to succeed after genuine effort.

The practices involved in this competency are the following:

- Treating all students according to the ethic of care
- Showing respect for all students as conditioned on such factors as culture
- Gender, class, and others
- Using judgment in treating all students equitably
- Taking appropriate responsibility for student learning and well being

To see how this competency fits into the domain of professional role responsibilities, please see Table 1.

Responding to Ethical Dilemmas With Sound Reasoning and Actions

Teachers reason thoughtfully through many practical dilemmas (Lampert, 1985, 2001). This competence also relies on cognitive capacities but shades into practice, into the enactment of ethical duties. The cognitive dimension involves how teachers recognize and reason through ethical dilemmas that arise when two or more principles may conflict in a particular situation, calling for teachers to exercise judgment, wisdom, and discretion in reasoning through and responding to such situations (Colnerud, 2006; Lyons, 1990). The work of teaching is full of such conflicts, for instance when a teacher is deciding between removing a disruptive student so as to meet the needs of the rest of the class, and keeping the student in the classroom to help the individual learn. Or when, in establishing high but attainable goals for each student, two teachers disagree with one another about a specific students' current capabilities. But the ethical imperative in teaching is not only cognitive. Rather, teachers identify with, enact, and live out such imperatives. They practice in an

ethical manner and this will require not only discernment but also courage and will. The idea of *exercise* indicates practice, repetition, doing as well as thinking. In these senses, teachers must exercise their duties to students, to the subjects they teach, to their role responsibilities.

Consider, for example, the practice of engaging all students in classroom discussions. Teachers need to balance the needs of students eager to participate, with those wanting to participate but not aggressively so. They need to push some students' to think harder about their contributions to class discussions, but as less confident students witness a teacher pushing back on a peer's thinking, they might be silenced or even less ready to participate. At the same time, there will be other students who do not want to participate at all, and who need to be engaged in other ways while the teacher builds their confidence to eventually chime in. Class discussions happen in real time, and teachers do not have the luxury of deliberating on who to call on next, why, when, and how, while also remaining true to the academic content being taught. Through repetition and practice, they develop a manner that models genuine interest in and commitment to all students' contributions.

The practices involved here include the following:

- Recognizing and framing ethical dilemmas
- Managing dilemmas in the best interests of students

To see how this competency fits into the domain of professional role responsibilities, please see Table 1.

Detecting and Correcting Biases of Various Kinds via Reflection and Feedback

Teachers observe a basic ethical command to identify and counter-act biases of various kinds in their treatment of students and in their interactions with family and community. All teachers experience biases toward some students and these may be relatively overt or more subtle and nuanced. These biases may involve the identification of students for special services, the privileging of some students over others, or misinterpreting student behavior or intention. Some biases stem from differences in students' and teachers' cultures and backgrounds (Boykin, Tyler, Watkins-Lewis, & Kizzie, 2006; Gay, 2000; Nieto, 2001; Ogbu, 1982). Teachers may be aware of certain forms of prejudice from the outset but be entirely unaware of other sources of bias in their interactions with students. The ethical injunction here is to surface and correct biases. To do so, teachers understand that bias is part of the human condition, examine their practice critically for their own biases, test whether these exert influence, and take corrective action.

There are many examples for teachers to consider. For example, calling on students in recitation-style lessons that distributes turns unfairly to the disadvantage of some students (Lampert, 1985); referring a first-grade African-American boy for special education because he is off-task but not considering a similar referral for a White student; subtly discouraging

girls from studying science; or failing to intervene when a student is bullied due to being lesbian, gay, bisexual, or transgendered. Seating patterns may play a role, teacher attention to students during seatwork, informal interchanges with students outside the classroom. Bias then may enter a teacher's practice in many ways, often beneath teachers' awareness. Consequently, teachers may need to conduct inquiries of various kinds to detect patterns that reflect bias. Then they must work out forms of remediation to counteract such biases in their treatment of students.

This competency is intertwined with a teacher's ability to design and implement inclusive and culturally responsive instruction. Bias is only acknowledged, ameliorated, and overcome through knowledge and awareness. Thus teachers explore and understand their own culture and how that culture shapes their values and perceptions. They also learn about students' cultural funds of knowledge, which empowers to teachers to see productive ways to bridge the gap between school culture and home culture.

The practices involved with this competency are:

- Examining one's practice for potential bias
- Identifying and taking action to correct or mitigate one's bias

To see how this competency fits into the domain of professional role responsibilities, please see Table 1.

Advocating Appropriately for Students

Teachers occupy positions within an administrative hierarchy in which they follow orders while also serving as client-oriented professionals responding to the voice of conscience (Guttman, 1987). Tension can arise between these two sources of authority over teaching. For example, when a teacher is required to alter a grade so a star athlete may compete, such tension is exposed. Advocating for students as a matter of professional conscience then may require judgment and backbone. Might the athlete benefit from participating in the game? Or, learn a bad lesson about privilege, power, and unequal treatment? Advocacy often implies conflict and the need to speak up on behalf of students who may be wronged in various ways by other parties—teachers, administrators, counselors, and parents. Advocacy sets a high standard in teaching, one that often requires going beyond the call of duty. What competence requires then is a judgment that teachers must make about cases that come up in their practice, but their professional role obligation calls for them to consider how to meet the standard of advocating for children.

The practices involved here include:

- Discerning students' best interests in situations of conflict and ambiguity
- Speaking and acting on behalf of students in difficult circumstances

To see how this competency fits into the domain of professional role responsibilities, please see Table 1.

Meeting Legal Responsibilities

Description and Rationale

Much law and policy in education serves to protect the interests of children. Consequently it is imperative that teachers enact their legal responsibilities with respect to students' rights and interests. This is fundamental to the injunction in licensure to do no harm. Beyond knowledge of law and regulation, teachers also must exercise judgment and discretion in application to cases as they arise. Reporting suspicion of child abuse, to take one example, requires discernment as the interests of both child and parent or guardian are at stake.

Drawing on their knowledge of laws, policies, and regulations pertaining to their work, teachers observe such regulations. These may include federal and state statutes, district policies, and school policies (additional to what the district requires). They include requirements set forth in collectively bargained contracts (when applicable), guidance on a range of matters established by school districts, state policies and federal regulations that originate from court decisions and federal agencies.

Legal requirements are particularly binding. Teachers comply with laws concerning student rights and protections pertaining to confidentiality, privacy, free speech, and other matters; treatment of children with special needs and language requirements; identification and reporting of children in potential cases of abuse, and others. They also attend to a wide range of state and district requirements that constitute terms for their service as these regulate such matters as curriculum, evaluation, professional development, grading policies, and service to the school, as well as with policies promulgated in particular schools. Examples might include extra duties during lunch, recess, before and after school.

While teachers observe such regulations, as professionals they also take action when regulations themselves do harm to students. Teachers during the civil rights era fought for integration, and others lobbied against discriminatory practices that were institutionalized against immigrants, girls, and students with special needs. Consequently, simple compliance with all forms of regulation does not satisfy the requirement to protect the interests of children as a teacher's cardinal duty. When policies and procedures hold potential for harm, teachers must speak out and exercise their duty to safeguard children.

Technology has introduced a new site for behavior on the part of teachers and students, with new requirements that teachers understand, including safe, legal, and ethical uses of technology and social media. Teachers attend to their uses of technology as implicating privacy, confidentiality, and communications with students that are appropriate, while also monitoring students' uses around the same issues, including for example, cyber-bullying.

While record keeping may, at first glance, appear too banal to be regarded as an important practice, certain records are required by law and that constitutes justification. Because teachers continuously track student learning toward a range of goals and objectives—academic, social, and emotional—they develop and use record-keeping systems to assist with this fundamental duty. Records deal with such matters as student completion of assignments, student progress in learning, and a range of noninstructional duties, especially concerning money (e.g., student payment for school pictures). Record-keeping is a duty prescribed by school and district policy, as well as federal and state regulations, but its importance orients around the systematic use of data to track student learning as an aid to planning, instruction, and instructional improvement (Mandinach & Honey, 2008). There are many ways to implement this requirement, and all teachers create feasible and accurate records of student progress along multiple dimensions of learning and development. Increasingly, school systems adopt electronic platforms for this purpose, and teachers understand how to use them appropriately. This becomes one practical aspect of attending to individual students based on accurate understanding of their development.

Two competencies are relevant here:

- Complying with all relevant laws and regulations
- Creating and maintaining accurate records of student progress and related matters

To see how this subdomain and competencies fit into the domain of professional role responsibilities, please see Table 1.

Complying With All Relevant Laws and Regulations

A primary professional obligation is to act in accord with the laws, policies, and regulations that apply to teaching work (Fischer, Schimmel, & Stellman, 2007). These range from federal and state requirements and court decisions to district and even school level policies that apply to many aspects of education. Protections of student rights, policies pertaining to students with special needs, ELLs, obligations concerning reporting of potential child abuse, and many others are implicated. Teachers actively comply with the law. Compliance is often straightforward, for example, reviewing and implementing any requirements set forth in IEPs for special needs students. In other instances, compliance may call on judgment. When teachers suspect child abuse, they proceeds cautiously, gathering information and consulting with others before acting on their observations. Compliance may also be relatively easy to act upon or may require determination, as when a school rule is being imperfectly enforced and teachers must decide how to comply in such a situation. Still, the basic requirement here is to know all relevant law and policy and then to comply (just noting the caveat, above, concerning teachers' fundamental duty to safeguard children).

The practices involved here include the following:

- Acting in compliance with relevant laws and regulations
- Exercising judgment in compliance-oriented situations

To see how this subdomain and competencies fit into the domain of professional role responsibilities, please see Table 1.

Creating and Maintaining Accurate Records of Student Progress and Related Matters

As employees of school districts, teachers maintain records of various kinds in compliance with requirements, but of great import are the records that teachers keep in conjunction with their efforts to track student progress in learning and in meeting the professional requirements associated with the ethic of continuous improvement. A nontrivial aspect of their practice is to determine how they keep track, in systematic fashion, of their students' learning and development, including such information as formative, benchmark, and summative assessments, communications with family members, occasional notes about individual students, and other matters. Experienced teachers have worked out record-keeping systems that assist them in tracking how their students are doing on a range of indicators and measures, both direct and unobtrusive, and this often involves adapting a district- or school-wide platform to their own needs. Teachers also draw on such information when they share evaluations with other teachers, consider placement issues, and inform other decisions they make about students over the course of a year. Teachers may keep journals, utilize websites, maintain file folders (paper or electronic), and make regular entries to keep information up to date and accurate. The critical issue here concerns decisions about the most critical indicators to use in continuously evaluating student progress. Test scores of various kinds are clearly one important source but teachers may want to supplement such measures with more qualitative indications of their own devising.

A second purpose in creating and maintaining records is to inform teacher efforts to improve their own instruction. Such information as periodic student surveys, peer observations, video records, and others may constitute a rich body of evidence that teachers compile and use in studying their own teaching with an eye to making improvements. Again, determining what to keep track of will vary from case to case, depending in part on where teachers sense weaknesses or deficiencies in their practice or feedback they receive on annual evaluations from their principal. For example, teachers seeking to improve their capability in working with ELLs may want to gather systematically evidence about how well their practice is meeting students' instructional needs. Examples of this kind can be multiplied, but the main point here with respect to this competency is the intention to base improvements on evidence of various kinds that teachers collect and analyze. Records of practice then constitute a critical resource for evidence-based improvements in teaching.

To summarize, the second domain of teaching competence concerns teachers' professional role responsibilities. These competencies support and interact with instruction in complex ways and they serve as important touchstones for teachers more generally as they fulfill the broader responsibilities associated with teaching as a professional role. Here, too, while the descriptions present these competencies in linear fashion and in four discrete areas, we stress again that teacher competence entails the dynamic, iterative, and cyclical interaction, revision, and adaptations of these areas of competence over time.

The practices entailed here include the following:

- Setting up accurate and efficient record-keeping systems
- Regularly maintaining and upgrading record-keeping systems

To see how this subdomain and competencies fit into the domain of professional role responsibilities, please see Table 1.

Concluding Observations

Frameworks such as this one are daunting for they seem to project a practice that is unattainable by the typical practitioner working in the usual circumstances of schooling. Consider, though, that this mapping sets forth competencies for the profession as a whole, rather than as an account or description of what typical practitioners do in the varied contexts of practice. Such an account is aspirational not least because the practices described here are difficult to enact and call for a high degree of knowledge, skill, and will. Such practice is not yet the norm in many schools, and the task ahead is to enable and extend best practices of the kind set forth in this framework. As mentioned in the introduction, public and professional consensus is required to determine what constitutes the standard for safe practice upon entry and what must be expected thereafter as teachers continue to develop an increasingly refined and effective practice. Here then is one resource for this important work.

As we have noted repeatedly, this report has limitations. It does not specify for a particular grade level or particular content domain what these competencies look like in concrete practice, nor does it thoroughly address every aspect of teaching that involves adapting to the needs of our increasingly diverse student population, a diversity that runs along lines of poverty, culture, ethnicity, race, gender, religion, and sexual orientation among other characteristics that make up the U.S. populace.

The report is also uneven in the level of specificity possible concerning teaching practices. As we have noted, the research fields that we drew upon do not always do integrative work of the sort entailed in teaching. Our hope is that this synthesis might pave the way for more research that embraces the complexity of understanding teaching practice in the contexts in which it takes place.

This report enters a sprawling landscape of related work. The Council for the Accreditation of Educator Preparation (CAEP), as the accreditation body for the profession, has recently issued its standards for teacher preparation programs and those standards are based on assumptions of teaching competency and the preparation of beginning teachers. The states—and many professional associations—also have issued professional standards for teachers that will bear some resemblances to this account, as do the myriad frameworks currently being used in the development of educator evaluation systems, including work by Danielson, Marzano, and other leaders in this area. Research on the measurement of teaching, for example, the MET study (see http://www.metproject.org/reports), is also related, as normative conceptions of effective teaching were used to frame relevant observation protocols and teacher, administrator, and student surveys. Finally, current work underway to develop assessments of teachers, either at entry (e.g., the edTPA) or later in one's career (e.g., NBPTS) are also driven by various conceptions of teacher competence.

We consulted all of these related areas of work in creating this document. Efforts of this kind always are works in progress, evolving as we learn more about high quality teaching, how to measure it accurately and responsibly, and the effectiveness of various programs of teacher preparation and professional development to nurture these competencies. Focused as it is on summarizing the existing literature and describing the broad range of competencies entailed in teaching, we hope this effort will contribute to that ongoing dialogue in meaningful and productive ways.

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