

# The Practice of and Support for Effective Teaching: Recent Research Evidence

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To understand the complex interaction of variables that constitute effective teaching practice, it is necessary to articulate what effective teachers do every day and identify the factors that support their effectiveness. The predominant frameworks developed by such researchers and practitioners as Danielson (1996, 2009), Marzano (2007), the University of Washington's Center for Educational Leadership (2012), and Hattie (2009, 2012) have consistently identified a laser-sharp focus on student learning as the distinguishing quality of effective teaching. Planning, designing, and implementing effective instruction and assessment demands a clear understanding of how teaching drives learning and how learning informs teaching. Effective teachers know their students—their learning styles as well as their strengths and deficits as learners. Effective teaching requires a mastery of subject matter; but even more importantly, it requires an unwavering focus on what and how individual students learn best—both driven by ongoing professional learning (Barry, 2010).

## Effective Teaching Practices

After more than 15 years of education research, John Hattie has linked the primary influences on the achievement of K–12 children to several highly effective teaching practices. His findings constitute the largest collection of evidence-based practices that actually work in schools to improve learning. According to Hattie (2012) there are five highly effective teaching practices that have the greatest impact on student learning: teacher clarity, classroom discussion, feedback, formative assessment, and the teaching of metacognitive strategies. Hattie (2012) defines these five teaching practices as follows:

**Teacher clarity:** When beginning a new unit of study or project with students, the teacher clarifies its purpose and learning goals and provides explicit criteria on how students can be successful. In addition, the teacher presents models or examples so the students can see what the end product looks like.

**Classroom discussion:** The teacher frequently steps “off stage” to facilitate whole-group discussions that allow students to learn from each other. By observing these whole-group discussions, the teacher can also formatively assess how well students are grasping new content and concepts.

**Feedback:** The teacher provides ongoing, consistent feedback, which allows students to gauge their relationship to what they are learning. Without feedback, both written and verbal, individual students cannot monitor their own progress. By sharing feedback with the entire class, the teacher can point out patterns in the students’ collective understanding while also observing further areas of need. Similarly, students can share feedback about their perceptions of their own growth and areas of need so the teacher can make incremental adjustments to the learning process, materials, and instructional practice.

**Formative assessment:** To provide students with effective and accurate feedback, teachers must assess their learning frequently and routinely, determining specifically where students are in relation to the unit of study’s learning goals or end product (summative assessment). Hattie found optimal value when teachers spent equal amounts of time on formative evaluation and summative assessment.

**Metacognitive strategies:** The teacher provides students with how to plan and organize themselves, how to monitor and direct their own work, and how to engage in self-reflection through the learning process. When teachers provide students with time and space to be aware of their own knowledge and their own thinking, student ownership in the learning outcomes increases.

## Washington State Teacher Evaluation Model

In 2010, the Washington State Legislature passed E2SSB 6696, a broad education reform bill that included a teacher evaluation model. The Washington State Teacher Evaluation Model has eight criteria and three “preferred” instructional frameworks to support implementation.

### Teacher evaluation criteria and descriptors

Researcher John Hattie’s groundbreaking study of effective teaching practices—published in *Visible Learning* (2009) and later updated in *Visible Learning for Teachers* (2011)—was the result of a meta-analysis of 800 studies on the factors that have the most impact on student learning. Hattie organized his findings into a framework describing six domains of effective teaching practices. Other practitioners and researchers, such as Danielson and Marzano, have developed frameworks that are quite similar to Hattie’s. In fact, if the Danielson and Marzano models are overlaid with Hattie’s top 20

influences on student learning, there is a great deal of overlap. Many of Hattie's influences are embedded within the eight criteria of the Washington State Teacher Evaluation Model.

### Washington state's eight teacher evaluation criteria

Teacher evaluation criteria	Teacher evaluation criteria descriptors
1. Centering instruction on high expectations for student achievement.	<b>Expectations.</b> The teacher communicates high expectations for student learning
2. Demonstrating effective teaching practices.	<b>Instruction.</b> The teacher uses research-based instructional practices to meet the needs of all students.
3. Recognizing individual student learning needs and developing strategies to address those needs.	<b>Differentiation.</b> The teacher acquires and uses specific knowledge about students' cultural, individual, intellectual, and social development and uses that knowledge to adjust their practice by employing strategies that advance student learning. Student growth data must be a substantial factor utilizing the OSPI-approved student growth rubrics
4. Providing clear and intentional focus on subject matter content and curriculum.	<b>Content knowledge.</b> The teacher uses content area knowledge, learning standards, appropriate pedagogy, and resources to design and deliver curricula and instruction to impact student learning.
5. Fostering and managing a safe, positive learning environment.	<b>Learning environment.</b> The teacher fosters and manages a safe and inclusive learning environment that takes into account physical, emotional, and intellectual well-being of students.
6. Using multiple student data elements to modify instruction and improve student learning.	<b>Assessment.</b> The teacher uses multiple data elements (both formative and summative) to plan, inform, and adjust instruction and evaluate student learning. Student growth data must be a substantial factor utilizing the OSPI-approved student growth rubrics.
7. Communicating and collaborating with parents and school community.	<b>Families and community.</b> The teacher communicates and collaborates with students, families, and all educational stakeholders in an ethical and professional manner to promote student learning.
8. Exhibiting collaborative and collegial practices focused on improving instructional practice and student learning.	<b>Professional practice.</b> The teacher participates collaboratively in the educational community to improve instruction, advance the knowledge and practice of teaching as a profession, and ultimately impact student learning. Student growth data must be a substantial factor utilizing the OSPI-approved student growth rubrics.

<http://tpep-wa.org/the-model/criteria-and-definitions>

### Three instructional frameworks

Washington state also approved three instructional frameworks, each of which provides a common language and vision of quality teaching that is aligned to the eight teacher evaluation criteria.

#### University of Washington, Center for Educational Leadership's Five Dimensions of Teaching and Learning

Research based on work conducted by the Center for Educational Leadership, classroom practice, and principal observation. The rubric includes five dimensions:

- Purpose
- Student engagement
- Curriculum and pedagogy
- Assessment for student learning
- Classroom environment and culture

#### Charlotte Danielson's Framework for Teaching

Research based on classroom-based observations, theorizing teaching practice, Measures of Effective Teaching project study, focus group feedback, and crosswalk with student assessment. The framework includes four domains:

- Planning and preparation
- Classroom environment
- Instruction
- Professional responsibilities

#### The Marzano Teacher Evaluation Model

Research based on meta-analysis, control studies, correlation studies, focus group feedback, and observations. The model includes four domains:

- Classroom strategies and behaviors
- Planning and preparing
- Reflecting on teaching
- Collegiality and professionalism

### Summary of Recent Research Evidence for the Washington State Teacher Evaluation Criteria

The following summary focuses on research studies that are pertinent to Washington state's eight teacher evaluation criteria and have been published since 2012. Note that there is some overlap in the research cited, as some studies have implications for more than one criterion. The summaries are derived from a large number of research papers and scholarly articles. In all cases the content reflects the thinking and conclusions of the researchers cited.

#### Criterion 1: Centering instruction on high expectations for student achievement

*Expectations: The teacher communicates high expectations for student learning.*

## Key findings

- *Teacher expectations profoundly impact children. Teachers must become consciously aware of how their own biases are expressed and controlled if they expect positive outcomes for their students.*
- *Teacher expectations affect student math achievement but those effects are mediated by student academic self-concept.*
- *Academic self-concept has a powerful effect on a number of important academic outcomes, but the improvement of academic self-concept is too challenging to make it the most meaningful target of educational interventions.*

Schwarz, K. A., Pfister, R., & Büchel, C. (2016). Rethinking explicit expectations: Connecting placebos, social cognition, and contextual perception. *Trends in Cognitive Sciences*, 20(6), 469–480.

Research has shown that expectancy effects are widespread phenomena that profoundly impact a wide range of cognitive processes such as perception, motor performance, working memory, and subjective evaluations, among others. An expectation is a “belief that something will happen or is likely to happen.” There are several expectancy effects pertinent in education, notably the Placebo effect, Hawthorne effect, and Pygmalion effect. The Placebo effect is the measurable improvement of a condition based upon the expectation that improvement will occur even when no intervention has been implemented. The Hawthorne and Pygmalion effects claim that outcome measures could be altered through an intervention not because of the effectiveness of the intervention itself but simply because an intervention was performed (Hawthorne) or because the teacher expected a change to occur (Pygmalion). These effects, viewed in the research as biases, are expected to be controlled in clinical studies. In the classroom, however, these effects profoundly impact children. Teachers must become consciously aware of how their own biases are expressed and controlled if they expect positive outcomes for their students.

Friedrich, A., Flunger, B., Nagengast, B., Jonkmann, K., & Trautwein, U. (2015). Pygmalion effects in the classroom: Teacher expectancy effects on students’ math achievement. *Contemporary Educational Psychology*, 41, 1–12.

Research has shown that a teacher’s expectations of a student affect that student’s academic progress. Many empirical studies have supported the predictions of this so called Pygmalion effect, but the effect sizes have tended to be small to moderate. Furthermore, almost all existing studies have examined teacher expectancy effects on students’ achievement at the student level only (does a specific student improve?) rather than at the classroom level (do classes improve when teachers have generally high expectations of their students?). This most recent scrutiny of the Pygmalion effect was conducted in a longitudinal study using a large sample in regular classrooms and by differentiating between two achievement outcomes (grades and an achievement test) and two levels of analyses (the individual and classroom levels). In addition, students’ self-concept was studied as a possible mediator of

the teacher expectancy effect on achievement. Data come from a study with 73 teachers and their 1,289 fifth-grade students. The researchers used multilevel regression analyses that yielded three main results. First, Pygmalion effects were found at the individual level for both achievement outcomes. Second, multilevel mediation analyses showed that teacher expectancy effects were partly mediated by students' self-concept. Third, teachers' average expectancy effects at the classroom level were found to be nonsignificant when students' prior achievement was controlled.

Trautwein, U., & Möller, J. (2016). Self-concept: Determinants and consequences of academic self-concept in school contexts. In A. A. Lipnevich, F. Preckel, & R. D. Roberts (Eds.), *Psychosocial skills and school systems in the 21st century: Theory, research, and practice* (pp. 187–214). New York, NY: Springer International.

Self-concepts are subjective beliefs about the qualities that characterize us, with academic self-concepts describing our beliefs about our own intellectual strengths and weaknesses. Research has shown that academic self-concept is an important outcome of schooling and one of the most powerful predictors of students' academic behavior, educational choices, and academic achievement. A broad range of research suggests that there are two major dimensions of self-comparison that impact the development of students' academic self-concept. First, students compare their mastery of academic content to other students' mastery both in the moment and over time. Second, students compare their social status and social understanding to other students continually.

There is some, but not complete, consensus in the literature that schools should foster relatively high levels of self-concept. However, the researchers caution that given the seemingly universal nature of social and dimensional comparisons and empirical data showing comparably minor differences across classes, schools, and school types, the improvement of academic self-concept does seem to be a rather challenging task. Researchers conclude that for this reason and despite the powerful effects of academic self-concept on a number of important academic outcomes, self-concept may not always be the most meaningful target of educational interventions.

## **Criterion 2: Demonstrating effective teaching practices**

*Instruction: The teacher uses research-based instructional practices to meet the needs of all students.*

### **Key findings**

- *Teachers must learn how to interpret the evidence for best practices if they are to understand when to implement them and with whom.*
- *Research-based practices that increase student learning and school improvement models should directly link what is known about effective educational practice with professional development strategies proven to change teacher practice.*

- *More of the variance in pupil outcomes is explained at the classroom level than at the school level and a large proportion of this classroom-level variance can be explained by teacher instructional practices.*

Rosenshine, B. (2012). Principles of instruction: Research-based strategies that all teachers should know. *American Educator*, 36(1), 12–19, 39.

Findings from three separate sources of research—research on how the mind acquires and uses information, the instructional procedures that are used by the most effective teachers, and the procedures invented by researchers to help students learn difficult tasks—all have implications for classroom instruction. Interestingly there is no conflict at all between the findings; and, in fact, a synthesis of the instructional ideas gleaned helps to support their validity. The author has synthesized the findings to provide a valid, research-based understanding of effective teaching practice. According to the author, the 10 most effective instructional strategies are as follows:

- **Begin a lesson with a short review of previous learning.** Daily review can strengthen previous learning and can lead to fluent recall. The development of expertise requires thousands of hours of practice; daily review is one component of this practice. The most effective teachers ensure that students efficiently acquire, rehearse, and connect knowledge. Many use hands-on activities, but always after, not before, the basic material is learned.
- **Present new material in small steps with student practice after each step.** Only present small amounts of new material at any time and then assist students as they practice this material. Teaching in small steps requires more time, and more effective teachers use this extra time to provide additional explanations, give many examples, check for student understanding, and provide sufficient instruction so that students learn to work independently without difficulty.
- **Ask a large number of questions and check the responses of all students.** Questions help students practice new information and connect new material to their prior learning. Questions allow a teacher to determine how well the material has been learned and whether there is a need for additional instruction. The most effective teachers also ask students to explain the process they used to answer the question, to explain how the answer was found.
- **Provide models.** Providing students with models and worked examples can help them learn to solve problems faster. The teacher modeling and thinking aloud while demonstrating how to solve a problem are examples of effective cognitive support. Worked examples are another form of modeling that allows students to focus on the specific steps to solve problems and thus reduce the cognitive load on their working memory. Many of the skills that are taught in classrooms can be conveyed by providing prompts, modeling use of the prompt, and then guiding students as they develop independence. This same procedure—providing a prompt, modeling, guiding practice, and supervising independent practice—can be used for many different tasks in mathematics, science, writing, and reading comprehension.



- **Guide student practice.** Successful teachers spend more time guiding students' practice of new material. It is not enough to simply present students with new material because the material will be forgotten unless there is sufficient rehearsal. An important finding from information-processing research is that students need to spend additional time rephrasing, elaborating, and summarizing new material in order to store this material in their long-term memory. When teachers provide sufficient instruction during guided practice, the student is better prepared for independent practice. When guided practice is too short, students are not prepared for seatwork and make more errors during independent practice.
- **Check for student understanding.** Checking for student understanding at each point can help students learn the material with fewer errors. Effective teachers check for understanding by asking questions, by asking students to summarize the presentation up to that point or to repeat directions or procedures, or by asking students whether they agreed or disagreed with other students' answers. Checking in with students in these various ways requires students to elaborate on the material they have learned and to augment connections to other learning in their long-term memory and alerts the teacher when portions of the material have to be retaught. Providing guided practice after teaching small amounts of new material, and checking for student understanding, helps limit the development of misconceptions.
- **Obtain a high success rate.** It is important for students to achieve a high success rate during classroom instruction and during their practice activities. Mastery learning is a form of instruction where lessons are organized into short units and all students are required to master one set of lessons before they proceed to the next set. Students are likely to develop misconceptions if too much material is presented at once and if teachers do not check for student understanding. Unless all students have mastered the first set of lessons, there is a danger that the slower students will fall further behind when the next set of lessons is taught. Researchers have found that the students of more effective teachers have higher success rates, as judged by the quality of their oral responses during guided practice and their individual work. The optimal success rate for fostering student achievement appears to be about 80 percent, which indicates that a student is being challenged while learning the material.
- **Provide scaffolds for difficult tasks.** The teacher provides students with temporary supports and scaffolds to assist them when they learn difficult tasks. Scaffolds are gradually withdrawn as learners become more competent, although students may continue to rely on scaffolds when they encounter particularly difficult problems. Scaffolding as a form of guided practice includes teacher modeling the steps to solve a problem, teacher thinking aloud while solving the problem, and teacher providing tools like cue cards or checklists. When scaffolding, the teacher might complete part of the task for students or provide a model of the completed task so that students can assess their own work against it. The teacher serves as a master, guiding students toward increasing independence.
- **Require and monitor independent practice.** Students need extensive, successful, independent practice in order for skills and knowledge to become automatic. This independent practice is necessary for the student



to become fluent and automatic in the skill being studied. When material is “overlearned” it is recalled automatically and does not require involvement of working memory. Once students become automatic in an area of study, they can devote more of their attention to comprehension and application. Researchers find that students are more engaged when their teacher circulates around the room and monitors and supervises their seatwork. The optimal time for these contacts was 30 seconds or less. Another effective strategy involves cooperative learning when students have the opportunity to get feedback from their peers about correct as well as incorrect responses, which promotes both engagement and learning. Cooperative/competitive settings are also valuable for helping slower students in a class by providing extra instruction for them.

- **Engage students in weekly and monthly review.** Students need to be involved in extensive practice in order to develop well-connected and automatic knowledge. Students need extensive and broad reading and extensive practice to develop well-connected networks of ideas (schemas) in their long-term memory. When knowledge on a particular topic is broad and well-connected it is easier to learn new information and prior knowledge is more readily available for use. Research on cognitive processing supports the need for extensive reading of a variety of materials, frequent review, and discussion and application activities. Material that is not adequately practiced and reviewed is easily forgotten.

Dean, C. B., Hubbell, E. R., Pitler, H., & Stone, B. J. (2012). *Classroom instruction that works: Research-based strategies for increasing student achievement* (2nd ed.). Alexandria, VA: ASCD.

The prevalent approach to increasing student achievement has been to focus on ensuring that all students reach standard benchmarks of performance. The authors argue that while the fundamental obligation of education is to ensure that all students make appropriate gains relative to the time they spend in the classroom, the truest evidence of effective teaching would be proficiency gains in the content as well as student progress and growth as a learner.

To ensure both teacher proficiency and student progress, teachers need to develop a common language for instruction and the effective use of a common set of instructional strategies that research has proven likely to increase student achievement.

Research suggests that effective teaching is not about identifying one method and implementing it exclusively. The authors say that for too long, educators have been obsessed with models of teaching, preferring one method over another, rather than with models of learning. It is time for educators to develop a wider view, or model, of how different influences in the classroom must work together to help all students realize their learning gains. Based upon an analysis of the research on instructional strategies using their model, the authors identified nine categories of instructional strategies and classroom

practices proven by solid evidence to be effective that should guide teachers' and administrators' way of thinking about teaching and learning. The nine categories they identified are:

1. **Setting objectives and providing feedback:** When teachers identify and communicate clear learning objectives, they send the message that there is a focus for the learning activities to come. This reassures students that there is a reason for learning and provides teachers with a focal point for planning instruction. Providing feedback specific to learning objectives helps students improve their performance and solidify their understanding.
2. **Reinforcing effort and providing recognition:** Effort and recognition speak to the attitudes and beliefs of students; however, teachers must show the connection between effort and achievement. Research shows that although not all students realize the importance of effort, they can learn to change their beliefs to emphasize effort. According to research, recognition is most effective if it is contingent on the achievement of a certain standard and symbolic recognition works better than tangible rewards.
3. **Cooperative learning:** Research shows that organizing students into cooperative groups yields a positive effect on overall learning. When applying cooperative learning strategies, teachers should keep groups small and not overuse this strategy. They should be systematic and consistent in their approach.
4. **Cues, questions, and advance organizers:** Cues, questions, and advance organizers help students use what they already know about a topic to enhance further learning. Research shows that these tools should be highly analytical, should focus on what is important, and are most effective when presented before a learning experience.
5. **Nonlinguistic representations:** According to research, knowledge is stored in two forms: linguistic and visual. The more students use both forms in the classroom, the more opportunity they have to achieve. Recently, use of nonlinguistic representation has proven to not only stimulate but also increase brain activity.
6. **Summarizing and note taking:** These skills promote greater comprehension by asking students to analyze a subject to expose what's essential and then put it in their own words. According to research, this requires substituting, deleting, and keeping some things and having an awareness of the basic structure of the information presented. Research shows that taking more notes is better than fewer notes, though verbatim note taking is ineffective because it does not allow time to process the information. Teachers should encourage and give time for review and revision of notes, which can be the best study guides for tests.
7. **Assigning homework and providing practice:** Homework provides students with the opportunity to extend their learning outside the classroom. However, there are conflicting conclusions about the value of homework. Some research suggests that the amount of homework assigned should vary by grade level and that parent involvement should be minimal. Other research questions the value of homework altogether (see Castro et al., 2015 below). If homework is required, teachers should explain the purpose of homework to both the student and the parent or guardian

and try to give feedback on all homework assigned. Research shows that students should adapt skills while they're learning them. Speed and accuracy are key indicators of the effectiveness of practice.

8. **Identifying similarities and differences:** The ability to break a concept into its similar and dissimilar characteristics allows students to understand (and often solve) complex problems by analyzing them in a more simple way. Teachers can either directly present similarities and differences, accompanied by deep discussion and inquiry, or simply ask students to identify similarities and differences on their own. Research shows that while teacher-directed activities focus on identifying specific items, student-directed activities encourage variation and broaden understanding. Research also notes that graphic forms are a good way to represent similarities and differences.
9. **Generating and testing hypotheses:** Research shows that a deductive approach (using a general rule to make a prediction) to this strategy works best. Whether a hypothesis is induced or deduced, students should clearly explain their hypotheses and conclusions.

The authors do not claim that these strategies are “silver bullets” or that they will be effective under all circumstances but that they are “best bets” if teachers incorporate them systematically and intentionally as they plan and deliver instruction. Teachers must know what the component parts of each strategy entail, how and when to use each strategy, and why each works in specific circumstances. To get the most out of this approach, teachers must bring to bear their knowledge of and skill with the instructional strategies, and they must exercise judgment and wisdom with regard to the use of the strategies. These researchers’ encourage educators to interpret evidence that relates to what works best in education to increase student achievement. Evidence provides teachers and administrators with grounds for making educated decisions that will maximize their impact.

Muijs, D., Kyriakides, L., van der Werf, G., Creemers, B., Timperley, H., & Earl, L. (2014). State of the art—teacher effectiveness and professional learning. *School Effectiveness and School Improvement*, 25(2), 231–256.

In their review of decades of educational effectiveness research, these researchers identified the importance of classroom-level characteristics (classroom climate, instructional practice) as a predictor of pupil outcomes as one of the key findings. This body of research suggests, according to the authors, that more of the variance in pupil outcomes is explained at the classroom level than at the school level and that a large proportion of this classroom-level variance can be explained by what teachers do in the classroom. It is because of correlational findings that classroom practice has become firmly integrated into theoretical and empirical models of educational effectiveness. School effectiveness studies and teacher effectiveness studies use

many of the same research methodologies, including standardized observation instruments and surveys to improve understanding of the relationship between learning and teaching.

One element that has traditionally been less developed in the study of educational effectiveness is teacher professional development. Researchers have noted this omission as “somewhat peculiar” in light of the importance of professional development in models of effective school improvement and the implication that teacher behaviors are key to educational effectiveness. The authors suggest that evidence-based practices that increase student learning and school improvement models should directly link what is known about effective classroom practice with professional development intended to change teacher practice.

### **Criterion 3: Recognizing individual student learning needs and developing strategies to address those needs**

*Differentiation: The teacher acquires and uses specific knowledge about students’ cultural, individual, intellectual, and social development and uses that knowledge to adjust their practice by employing strategies that advance student learning.*

#### **Key findings**

- *Differentiated instruction involves conducting ongoing assessments of student abilities, identifying appropriate content based on those abilities, using flexible grouping arrangements for students, and varying how students can demonstrate proficiency in their learning.*
- *Effective differentiation likely will arise from consistent, reflective, and coherent efforts to address the full range of learner readiness, interest, and learning profile in presentation of information, student practice or sense making, and student expression of learning.*
- *Differentiation is considered a complex approach to implement, requiring extensive and ongoing professional development for teachers and administrators.*
- *No large-scale, scientific study of differentiated instruction has been conducted to produce empirical evidence that the total package that comprises differentiated instruction has a positive impact on student achievement.*

Tomlinson, C. A. (2014). *The differentiated classroom: Responding to the needs of all learners* (2nd ed.). Alexandria, VA: ASCD.

Sparks, S. D. (2015, January 28). Differentiated instruction: A primer. *Education Week*, 34(20). Retrieved from [http://www.edweek.org/ew/articles/2015/01/28/differentiated-instruction-a-primer.html?qs=January+28,+2015+inmeta:Cover\\_year%3D2015](http://www.edweek.org/ew/articles/2015/01/28/differentiated-instruction-a-primer.html?qs=January+28,+2015+inmeta:Cover_year%3D2015)

The concept, “differentiated instruction” evolved in part from instructional methods advocated for gifted students and in part as an alternative to academically separating students of different ability levels into groups or classes (i.e., tracking). Differentiating instruction involves such practices as small-group work, team teaching, objective-based testing, and monitoring of student progress. Proponents argue that differentiation is, at its base, not an approach but a basic tenet of good instruction, in which teachers develop relationships with students and present materials and assignments in ways that respond to the students’ interests and needs (Tomlinson, 2014) and leverage the culture of the classroom.

Critics argue that the theory of differentiated instruction does not translate easily into practice. In practice, differentiation is such a broad and multifaceted approach that it has proven difficult to implement properly or study empirically. Critics contend that both in planning time and instructional time, differentiation takes longer than using a single lesson plan for a given topic, and many teachers attempting to differentiate have reported feeling overwhelmed and unable to reach each student equally (Sparks, 2015).

A research report (Goodwin, 2010) noted that “to date, no empirical evidence exists to confirm that the total package that comprises differentiated instruction (e.g., conducting ongoing assessments of student abilities, identifying appropriate content based on those abilities, using flexible grouping arrangements for students, and varying how students can demonstrate proficiency in their learning) has a positive impact on student achievement.” The report speculates, however, that one reason for this lack of evidence may simply be that no large-scale, scientific study of differentiated instruction has been conducted. Hattie’s 2009 book *Visible Learning* had previously synthesized studies of more than 600 models of personalizing learning based on student interests and prior performance and found them not much better than general classroom instruction for improving students’ academic performance.

With the use of technology, it has become easier to differentiate and personalize instruction by developing and monitoring education plans for dozens of students at the same time. Differentiation of school-level programs is apparent in early warning systems and student dashboards that aim to track individual student performance in real time, as well as initiatives in some schools to develop and monitor individualized learning plans with the student, his or her teachers, and parents. By any account, differentiation is considered a complex approach to implement, requiring extensive and ongoing professional development for teachers and administrators (Sparks, 2015).

Parsons, S. A., Dodman, S. L., & Burrowbridge, S. C. (2013). Broadening the view of differentiated instruction. *Phi Delta Kappan*, 95(1), 38–42.

Teachers who effectively differentiate their instruction not only carefully plan instruction to differentiate for the variety of learners in the classrooms but also provide moment-by-moment adaptations to meet specific needs that become clear during instruction—needs that were not or could not be anticipated.

Tomlinson (2003) argued that effective differentiation likely will arise from consistent, reflective, and coherent efforts to address the full range of learner readiness, interest, and learning profile in presentation of information, student practice or sense making, and student expression of learning.

Teachers who effectively differentiate their instruction demonstrate three attributes:

1. Consistent assessment of student progress in multiple ways.
2. Extensive knowledge about how students learn and effective pedagogy.
3. High degree of self-reflection: reflection in action and reflection on action.

As the degree of diversity of the K–12 student population increases, it is critical that teachers differentiate their instruction to be responsive to the diverse cultural needs of all their students. To differentiate their instructional practice successfully, they require support from district and school leaders and professional development providers for their facility for differentiating instruction. Teachers must work within a culture that provides training and supports on formal and informal assessments, emphasizes the value of different kinds of knowledge (i.e., explicit, tacit, descriptive, and procedural), and encourages them to self-reflect both during and after taking instructional action.

#### **Criterion 4: Providing clear and intentional focus on subject matter content and curriculum**

*Content knowledge: The teacher uses content area knowledge, learning standards, and appropriate pedagogy and resources to design and deliver curricula and instruction to impact student learning.*

#### **Key findings**

- *Professional development programs aimed at the development of teachers' pedagogical content knowledge should be organized in ways that closely align to teachers' professional practice, including opportunities to implement innovative instructional strategies and materials and to reflect, individually and collectively, on their experiences.*
- *Teachers with the proper subject matter knowledge of a given concept can achieve larger gains with their students than can those lacking that subject matter knowledge.*
- *Both content knowledge for teaching and curriculum materials matter for instruction: Content knowledge contributes to the richness of content-related language while ambitious curriculum materials set the stage for engaging students in content-related thinking and reasoning.*

Van Driel, J. H., & Berry, A. (2012). Teacher professional development focusing on pedagogical content knowledge. *Educational Researcher*, 41(1), 26–28.



The development of pedagogical content knowledge goes beyond the acquisition of instructional strategies and techniques: It must also include an understanding of how students develop insights in specific subject matter. This implies that professional development programs aimed at the development of teachers' pedagogical content knowledge should be organized in ways that closely align to teachers' professional practice, including opportunities to implement innovative instructional strategies and materials and to reflect, individually and collectively, on their experiences.

Examining examples of instructional practices, both "good" and flawed, as well as evidence of effectiveness from the research literature and other resources within the context of professional learning communities (PLCs) can have a very useful role in helping teachers to explain and discuss key notions of teaching and learning a specific topic. PLCs can thus contribute to the identification of a collective pedagogical content knowledge, which becomes a shared or common form of teachers' professional practical knowledge about teaching certain subject matter. At the same time, individual teachers can adapt this shared knowledge and complement it with their own experience and classroom dynamics.

Sadler, P. M., Sonnert, G., Coyle, H. P., Cook-Smith, N., & Miller, J. L. (2013). The influence of teachers' knowledge on student learning in middle school physical science classrooms. *American Educational Research Journal*, 50(5), 1020–1049.

There is little agreement on exactly what kinds of knowledge are most important for teachers to possess. Should a teacher have a deep knowledge of the subject matter gleaned from college study, additional graduate courses, or even research experience? Or, is it better if the teacher has an understanding of what students think? Is there some optimal combination of different types of knowledge? This study examined the relationship between teacher knowledge and student learning for 9,556 students of 181 middle school physical science teachers.

Findings indicate that a teacher's subject matter knowledge is an important predictor of student learning. Effective teachers must know the concepts they teach. Attempts in the past to characterize teacher knowledge through global scores on written tests have failed to produce strong predictors of student learning. Hence, a finer grain size of analysis becomes essential here. While one may assume that the science content of middle school physical science is, in general, well understood by teachers, there are noticeable holes in their knowledge, and these weaknesses differ by teacher. It is not surprising that teachers with the proper subject matter knowledge of a given concept can achieve larger gains with their students than can those lacking that subject matter knowledge; a teacher without knowledge may teach the concept incorrectly, and students may end up with the same incorrect belief as their teacher. Researchers also found that a teacher's ability to identify students' most common wrong answer on multiple-choice items, a form of pedagogical content knowledge, is an additional measure of science teacher competence.



Charalambous, C. Y., & Hill, H. C. (2012). Teacher knowledge, curriculum materials, and quality of instruction: Unpacking a complex relationship. *Journal of Curriculum Studies*, 44(4), 443–466.

Over the past 20 years, there has been a growing interest in two key resources within the instructional system: teacher knowledge and curriculum materials. Despite rapidly accumulating studies that investigate the utility and utilization of each resource independently, research studies that focus on both resources are scarce. Although research on teachers' knowledge acknowledges the role that curriculum materials play in shaping instruction, curriculum has largely been treated incidentally. Similarly, although teachers' use of curriculum materials is often assumed to be influenced by their knowledge, studies exploring this association have typically not used objective measures of teacher knowledge. The importance of simultaneously attending to both resources has been both conceptually justified and empirically supported by the few studies situated at the intersection of teacher knowledge, curriculum use, and the quality of instruction.

In a multiple-case study, both instructional resources—teacher knowledge and curriculum materials—were examined to understand how they individually and jointly contribute to instructional quality. The approach of this inquiry was to compare lessons taught by teachers with differing mathematical knowledge for teaching (MKT), and their use of a U.S. standards-based curriculum. Researchers found that both mathematical knowledge for teaching and curriculum materials matter for instruction. The contribution of MKT was more prevalent in the richness of the mathematical language employed during instruction, the explanations offered, the avoidance of errors, and teachers' capacity to highlight key mathematical ideas and use them to weave the lesson activities.

By virtue of being ambitious, the curriculum materials set the stage for engaging students in mathematical thinking and reasoning; at the same time, they amplified the demands for enactment, especially for the low-MKT teachers. The analysis also helped develop three tentative hypotheses regarding the joint contribution of mathematical knowledge for teaching and the curriculum materials. When supportive and when followed closely, curriculum materials can lead to high-quality instruction, even for low-MKT teachers. In contrast, when unsupportive, they can lead to problematic instruction, particularly for low-MKT teachers. High-MKT teachers, on the other hand, might be able to compensate for some of the limitations of the curriculum materials and offer high-quality instruction.

### **Criterion 5: Fostering and managing a safe, positive learning environment**

*Learning environment: The teacher fosters and manages a safe and inclusive learning environment that takes into account physical, emotional, and intellectual well-being.*

## Key findings

- *A whole school approach to student well-being enhances not only mental health and resilience but also promotes prosocial behavior, pupil engagement, and academic learning.*
- *When a classroom climate is characterized by warm, respectful, and emotionally supportive relationships, students perform better academically in part because they are more emotionally engaged in the learning process.*
- *Classrooms are complex systems that affect students' literacy learning through the interacting effects of content and amount of time individual students spent in literacy instruction within the context of the global quality of the classroom learning environment.*
- *For at-risk students, student-level factors are the strongest and most consistent predictors of academic outcomes (findings at odds with those for non-at-risk students that found teacher-level factors the strongest and most consistent predictors of academic outcomes).*
- *Professional development focused specifically on teachers' emotional, organizational, and instructional interactions with adolescent students may enhance teacher effectiveness in ways that have a direct effect on student learning.*
- *Frequent exposure to reform practices is especially critical for students who judge themselves as being less capable in mathematics and who are lower performers.*
- *Teachers with a higher sense of self-efficacy were more likely to interact with their students in sensitive and responsive ways to support their learning and provide a more positive classroom environment than did teachers with lower self-efficacy, and their students demonstrated stronger literacy skills*

Roffey, S. (2015). Becoming an agent of change for school and student well-being. *Educational & Child Psychology*, 32(1), 21–30.

Definitions of well-being are evolving with a changing emphasis from subjective well-being to a broader view that encompasses issues of equality and the qualities of organizations and communities and whole societies. There is recognition that well-being is the outcome of complex and interactive predispositions, experiences, processes, and values. There is more awareness of the factors that contribute to well-being and increasing insight into the practices and processes that foster both individual and community well-being.

Research cited in this paper indicates that a whole school approach to student well-being enhances not only mental health and resilience but also promotes prosocial behavior, pupil engagement, and academic learning. When schools focus on the well-being of the whole child, this not only benefits individuals but the communities in which they participate. Resilience is a characteristic of students who experience well-being in their surroundings. They share a positive attitude toward life; a sense of humor; a pro-social orientation; persistence, self-confidence, and self-esteem; a willingness and ability to talk about issues; comfort in their own skin; and intelligent problem solving.

Within their environment, resilient students sense that they are special and cared for by someone in their lives, that someone has high expectations of them, and that they belong and are valued for their contributions.

Research suggests seven pathways to well-being in school: physical and emotional safety, pro-social values, social and emotional learning, a supportive and caring school community, a strengths-based approach, a sense of meaning and purpose, and a healthy lifestyle. Student well-being is a whole-school/whole-student approach that puts the learner at the heart of educational endeavors. It applies to leadership vision and management style, the level of social capital throughout the school, pedagogy, policy, and practice. It is what people communicate and how they do it. It is how people feel, as well as what they do. It is proactive and preventative. It means having high expectations for all.

Connor, C. M., Spencer, M., Day, S. L., Giuliani, S., Ingebrand, S. W., McLean, L., & Morrison, F. J. (2014). Capturing the complexity: Content, type, and amount of instruction and quality of the classroom learning environment synergistically predict third graders' vocabulary and reading comprehension outcomes. *Journal of Educational Psychology*, 106(3), 762–778.

These researchers studied classrooms as complex systems that affect students' literacy learning through interacting effects of content and amount of time individual students spent in literacy instruction within the context of the global quality of the classroom learning environment. They observed 27 third-grade classrooms serving 315 target students using two different observation systems. The first assessed instruction at a more micro level; specifically, the amount of time individual students spent in literacy instruction defined by the type of instruction, role of the teacher, and content. The second assessed the quality of the classroom learning environment at a more macro level, focusing on classroom organization, teacher responsiveness, and support for vocabulary and language. Results revealed that both global quality of the classroom learning environment and time individual students spent in specific types of literacy instruction covering specific content interacted to predict students' comprehension and vocabulary gains, whereas neither system alone did. These findings support a dynamic systems model of how individual children learn in the context of classroom literacy instruction and the classroom learning environment, which can help to improve observations systems, advance research, elevate teacher evaluation and professional development, and enhance student achievement.

Reyes, M. R., Brackett, M. A., Rivers, S. E., White, M., & Salovey, P. (2012). Classroom emotional climate, student engagement, and academic achievement. *Journal of Educational Psychology*, 104(3), 700–712.

Research has shown that student engagement is vital to academic achievement. Engaged students are attentive and participate in class discussion, exert effort in class activities, and exhibit interest and motivation to learn. Effective

learning is contingent upon the extent to which students are engaged in classroom learning activities. The quality of social and emotional interactions in the classroom—between and among students and teachers—creates the classroom emotional climate. This study examined the link between classroom emotional climate and academic achievement, including the role of student engagement as a mediator.

As predicted, the analyses showed that the positive relationship between classroom emotional climate and grades was mediated by engagement, while controlling for teacher characteristics, and observations of both the organizational and instructional climates of the classrooms. Effects were robust across grade level and student gender. The researchers conclude that authentic instruction cannot take place unless teachers attend to the social and emotional aspects of learning. They demonstrate that when a classroom climate is characterized by warm, respectful, and emotionally supportive relationships, students perform better academically in part because they are more emotionally engaged in the learning process.

Ball, C. R., Finch, W. H., & Gettinger, M. (2014). Classroom-level effects on the reading and behavior of at-risk kindergarteners. *Preventing School Failure*, 58(2), 80–89.

For several decades, there has been increasing focus on the effects of teacher characteristics and classroom variables on student performance. Despite the many teacher-level factors (expectancy factors) and classroom-level factors (classroom culture), identified as important contributors to learning, there is limited research on the efficacy of these variables to improve outcomes for the lowest performing learners. These researchers aimed the focus of their study on the effects of classroom-level variables on the reading and behavioral outcomes of at-risk kindergarten students.

When the researchers controlled for student factors to examine the effects of (a) teacher variables, (b) context variables, and (c) instructional variables on several student outcomes, they found that student-level factors were the strongest and most consistent predictors of student outcomes. After controlling for student factors, classroom- and school-level variables were relatively poor predictors. (Note: these findings are at odds with those for non-at-risk students that found teacher-level factors the strongest and most consistent predictors of academic outcomes). The researchers urge practitioners to screen and identify as early as possible those students who may not be adequately prepared for the academic and social challenges of the classroom and may be at-risk for reading and behavioral difficulties. These risk factors for school failure are identifiable upon school entry and tend to persist across time if not countermanded early on. The researchers suggest that for at-risk students baseline performance is a much better indicator of future performance than teacher, context, or instructional factors; and the use of multiple measures is likely advisable to document the severity of early reading difficulties.

Allen, J., Gregory, A., Mikami, A., Lun, J., Hamre, B., & Pianta, R. (2013). Observations of effective teacher-student interactions in secondary school classrooms: Predicting student achievement with the Classroom Assessment Scoring System—Secondary. *School Psychology Review*, 42(1), 76–98.

Improving the quality of teacher-student interactions within the secondary school classroom depends upon a solid understanding of the nature of effective teaching for adolescents. Research suggests three domains of teacher-student interactions: emotional supports, classroom organization, and instructional supports. Within each domain are specific dimensions of classroom interactions that past research suggests are likely to support student learning including, positive classroom climate, teacher sensitivity, and regard for adolescent perspectives. These researchers sampled 643 students enrolled in 37 secondary school classrooms to predict future student achievement (controlling for baseline achievement) from observed teacher interactions with students in the classroom. After accounting for prior year test performance, qualities of teacher interactions with students predicted student performance on end-of-year standardized achievement tests.

Results indicate that classrooms characterized by a positive emotional climate with sensitivity to adolescent needs and perspectives, use of diverse and engaging instructional learning formats, and a focus on analysis and problem solving were associated with higher levels of student achievement. Effects of higher quality teacher-student interactions were greatest in classrooms with fewer students. Researchers suggest that professional development focused specifically on teachers emotional, organizational, and instructional interactions with adolescent students may enhance teacher effectiveness in ways that have a direct effect on student learning.

Gilbert, M. C., Musu-Gillette, L. E., Woolley, M. E., Karabenick, S. A., Strutchens, M. E., & Martin, W. G. (2014). Student perceptions of the classroom environment: Relations to motivation and achievement in mathematics. *Learning Environments Research*, 17(2), 287–304.

This study examined the relationship of middle school students' perceptions of their mathematics classroom environment to their motivation and achievement. Researchers found that when students were motivated by how useful they thought the content to be, their own achievement goals, and their perception of how well they understood the content, these factors mediated the influence of their perceptions of teacher expectations, teacher support, and teacher use of reform practices on their performance on standardized achievement tests. For students with lower mathematics capability, their perceptions of more frequent use of reform practices in their mathematics class related to higher standardized test performance. For students with higher mathematics capability, perceived use of reform practices did not significantly relate to standardized test performance. These data suggest that frequent exposure to reform practices is especially critical for students who judge themselves as being less capable in mathematics and who are

lower performers. An important implication of this study is the need for coordinated, ongoing professional development that highlights reform pedagogy and beliefs while also focusing on student motivation theories and strategies.

Guo, Y., Connor, C. M., Yang, Y., Roehrig, A. D., & Morrison, F. J. (2012). The effects of teacher qualification, teacher self-efficacy, and classroom practices on fifth graders' literacy. *Elementary School Journal*, 113(1), 3–24.

There is a growing body of research literature suggesting the importance of a teacher's self-efficacy (the teacher's belief in his or her own ability to complete tasks and reach goals) and a teacher's qualifications (years of education and experience) as sources of influence on student achievement. In this correlational study, researchers measured the effects of teacher self-efficacy and teacher qualifications while simultaneously investigating the unique contribution of each to teachers' classroom practices and students' reading skill development.

First, researchers measured teacher self-efficacy to determine the extent to which teachers believe they can make a difference in their students' achievement. Results indicated that teachers with a higher sense of self-efficacy were more likely to interact with their students in sensitive and responsive ways to support their learning and provide a more positive classroom environment than did teachers with lower self-efficacy, and their students demonstrated stronger literacy skills. On the other hand, teachers' education did not significantly predict any student outcome. Finally, researchers found significant direct effects of teacher support for learning on student outcomes. Specifically, in this study, teacher support for learning positively predicted fifth-grade literacy skills. These fifth-graders learned more when their teachers communicated with them in more emotionally supportive and responsive ways and provided evaluative feedback and a classroom environment that supported learning.

A surprising finding—that teachers with greater self-efficacy and more years of experience spent less time in academics—is inconsistent with the commonly held view that as teachers spend more time on academic activities, students are more likely to have higher scores in reading outcome. The negative association found in this study may suggest that the quality of time in instruction was poor or not targeted on content-area literacy or reading comprehension.

### **Criterion 6: Using multiple student data elements to modify instruction and improve student learning.**

*Assessment: The teacher uses multiple data elements (both formative and summative) to plan, inform and adjust instruction and evaluate student learning.*



## Key findings

- *Data literacy is a critical part of effective teaching: Teachers need preservice and ongoing instruction in data literacy, data privacy rights, and applying different kinds of data for different purposes.*
- *When making sense of data, teachers most often attributed student outcomes to instruction; however, they frequently focused on student characteristics as plausible explanations for the results, which reflected and reinforced low expectations for English language learners and students in special education.*
- *Helping teachers understand how to use disparate data to further understand their own students' strengths, misunderstandings, or misinterpretations, as evidenced through assessment data or experiential evidence, is key to successful use of data-driven decision-making principles.*
- *Educators across the school system likely need additional support in understanding how different kinds of assessments and their results can be used in ways that are complementary.*
- *Knowledge is critical to the health of a learning organization. Schools or districts become "smarter" when knowledge is generated, transferred, and preserved because this enables individuals to build on their own prior learning and provides new learning to other individuals. Knowledge is not restricted to use by a few individuals but rather serves the whole organization.*

Mandinach, E. B., Parton, B. M., Gummer, E. S., & Anderson, R. (2015). Ethical and appropriate data use requires data literacy. *Phi Delta Kappan*, 96(5), 25–28.

Student data can be a powerful, transformative tool in teaching, but to reap those potential benefits, these researchers argue that practitioners must become more data literate. Data literacy is a critical part of effective teaching. As the proliferation of data increases and as parental and public concerns about the safety of data remain, the ethical use of data must be a focus for teachers.

Mandinach and Gummer (2016) define data literacy for teaching as “the ability to transform information into actionable instructional knowledge and practices by collecting, analyzing, and interpreting all types of data (e.g., assessment, school climate, behavioral, snapshot, longitudinal, moment-to-moment) to help determine instructional steps. It combines an understanding of data with standards, disciplinary knowledge and practices, curricular knowledge, pedagogical content knowledge, and an understanding of how children learn” (as cited in Mandinach, Parton, Gummer, & Anderson, 2015, p. 26)

They proffer three main domains of knowledge that they combine to enable teachers to know what the data mean in terms of their content area and within a learning progression and then to translate that knowledge into instructional steps. The three domains are:

- Data use for teaching or what might be considered the ability to analyze and use data.
- Content knowledge or teacher understanding of a specific domain or subject.



- Pedagogical content knowledge or the ability to apply knowledge of pedagogy in the context of the content area.

To understand their responsibility in using and protecting student data, teachers need preservice and ongoing instruction in data literacy, data privacy rights, and applying different kinds of data. Learning how to derive meaningful information from data, how to protect students' privacy rights, and how to appropriately use different kinds of data for different purposes are essential to ensure that the public and teachers feel comfortable that data are a tool for helping students. Training on FERPA (Family Educational Rights and Privacy Act of 1974) compliance alone will not lead to ethical data use.

Bertrand, M., & Marsh, J. A. (2015). Teachers' sensemaking of data and implications for equity. *American Educational Research Journal*, 52(5), 861–893.

The national discourse around data-driven decision making in education drives the demand for data to inform instruction, but few studies have considered the key aspect of such a reform: how teachers make sense of the data (Coburn & Turner, 2011, 2012). Sensemaking is critical to consider in light of implications related to the effectiveness of data-use policies and the possible impacts on some student groups, such as English language learners and students in special education. A key aspect of teachers' sensemaking of data is the way in which teachers explain or make sense of the root causes of the outcomes observed in the data. How teachers attribute outcomes is especially important since this shapes their future instruction and expectations for students. For instance, teachers may attribute low test scores to prior instruction, as expected by data-use policies (Datnow, Park, & Kennedy-Lewis, 2012) or to perceived student deficits. These different paths of attribution have implications for instruction and learning.

These researchers drew on data collected in six middle schools to investigate how teachers make sense of data—including assessment results, student work, and observations—and the factors shaping these attributions. They found that when analyzing student data, teachers invoked one or more mental models of sensemaking that led them to attribute results to instruction, student understanding, the nature of the test, and student characteristics. Because of these models, teachers could formulate understandings that informed their choice of next instructional steps. On a positive note, the researchers found that teachers most often attributed student outcomes to instruction; however, they frequently focused on student characteristics as plausible explanations for the results, which reflected and reinforced their low expectations for the English language learners and students in special education. The researchers posit that the school context plays an important role in shaping the sensemaking process for teachers.

Schifter, C. C., Natarajan, U., Ketelhut, D. J., & Kirchgessner, A. (2014). Data-driven decision making: Facilitating teacher use of student data to inform classroom instruction. *Contemporary Issues in Technology and Teacher Education*, 14(4), 419–432.

Data-driven decision making is essential in K–12 education today, but teachers often do not know how to make use of extensive data sets. This research shows that teachers are insufficiently taught how to use multiple data sets to reflect on student progress or to differentiate instruction. Using data for accountability in developing, guiding, and sustaining organizational change in schools leading to improvements in student learning has been the focus of much research on systemic efforts to improve schools. The key to successful use of data-driven decision-making principles is helping teachers understand how to use disparate data to further understand their own students' strengths, misunderstandings, or misinterpretations as evidenced through assessment data or experiential evidence. Researchers emphasize that effective data use requires going beyond the numbers and their statistical properties to make meaning of them, thus translating data into knowledge to inform instruction.

Farrell, C. C., & Marsh, J. A. (2016). Metrics matter: How properties and perceptions of data shape teachers' instructional responses. *Educational Administration Quarterly*, 52(3), 423–462.

Within a context of sensemaking, these researchers conducted a one year comparative study of five low-income, high-needs middle schools in three districts to explore how features of data and teachers' perceptions of them may matter when teachers consider student learning data. They found that different forms of data lead to a wide range of instructional responses. For example:

- State assessments (from the previous school year), used largely at the beginning of the school year, aided teachers in grouping their students but did little to promote a change in instructional delivery.
- District benchmark data, which teachers generally found useful for reteaching and retesting content, creating small groups, and having students reflect on their data, did not lead to a change in pedagogy.
- Data from common grade assessments—valued for their closeness to instruction as well as their predictive information for future success on state assessments—were most often tied to regrouping or reteaching standards not yet mastered by students, but there was some promise of change in pedagogy.
- Classroom assessment results and student work, identified by teachers as very useful, were proportionately most often linked to changes in instructional delivery.

Researchers conclude that their findings point to a disconnect between purpose and use of different kinds of data (e.g., systems-level data and those data that are generated and analyzed within classrooms and schools). Many

educational leaders have embraced systemic, centralized data as an important source of information. These efforts may not tap into teachers' current instructional practices that involve making decisions based on results from classroom assessments, student work, and other types of formative assessment. Furthermore, many teachers recognize the value of quick, formative assessments for understanding student learning but do not classify the results as "data," as they are often not quantified, formally collected, or measured against a state standard.

Based on these findings, researchers recommend broadening the definition around what are considered useful data for instructional decision making in schools. Educators across the school system likely need additional support in understanding how different kinds of assessments and their results can be used in ways that are complementary. Finally, given their perceived value and ties to changes in delivery, administrators may also want to support teachers' classroom or common grade assessment practices, providing additional training and time to ensure that teacher-developed assessments are rigorous and of high quality.

Jimerson, J. B., & Wayman, J. C. (2015). Professional learning for using data: Examining teacher needs and supports. *Teachers College Record*, 117(4), 1–36.

These researchers examined data-related professional learning in three school districts. Guided by an organizationally based conceptual framework, they examined two research questions:

1. What knowledge and skills do teachers need to engage in data-informed practice?
2. How do professional learning supports address those needs?

Researchers observed that there was often a mismatch between teacher needs and the level of detail in district-provided supports for data-related professional needs. They found that teachers and leaders focus on getting data and interpreting it but not in collaboration and without a common language.

The results of this study are potentially important for improved data use because the authors suggest few studies have examined data-related professional learning as an organizational process. Organizational research has noted the importance of knowledge generation but has also noted that the transfer and preservation of this knowledge is critical to the health of a learning organization. Through transfer and preservation, knowledge is made rich. It enables individuals to build on their own prior learning, and it provides new learning to other individuals. Knowledge is not restricted to use by a few individuals but serves the whole organization. Thus, the school or district becomes "smarter."

## **Criterion 7: Communicating and collaborating with parents and school community.**

*Families and community: The teacher communicates and collaborates with students, families, and all educational stakeholders in an ethical and professional manner to promote student learning.*

### **Key findings**

- *Family engagement flourishes when student achievement and school improvement are seen as a shared responsibility, relationships of trust and respect are established between home and school, and families and school staff see one another as equal partners.*
- *School outreach to parents and the family's involvement with the school are associated with reading and math achievement gains in kindergarten.*
- *Parental involvement programs, as a whole, are significantly associated with higher academic achievement both for younger (pre-elementary and elementary school) and older (secondary school) students, as well as for four types of parental involvement programs.*
- *The relationship between parental involvement and academic achievement was found to be consistent across different grade levels and ethnic groups; however, the strength of that relationship varied based on the type of assessment that was used to measure student achievement.*
- *The largest positive relation between parent participation and academic achievement is detected when global measures of academic achievement are considered and when it is estimated by standardized measures.*
- *New educators dramatically increase their understanding of family situations when they hear from and interact with parents who have children with special educational needs, unique talents, or who are learning more than one language.*
- *Parent-school relationships are positively associated with parent's perceptions of their children's grades, promotion, and good behavior at school above and beyond the effect of family socioeconomic status and race/ethnicity.*
- *Both parents and teachers recognize the need for a systematic, organized, and institutional approach to involvement that could establish common expectations, patterns, and protocols to facilitate parent-teacher interactions.*
- *Parental involvement was positively associated with behavioral and cognitive engagement, which in turn contributed to academic competence and achievement.*

Mapp, K. L., & Kuttner, J. P. (2013). *Partners in education: A dual capacity-building framework for family-school partnerships*. Retrieved from U.S. Department of Education website: <http://www2.ed.gov/documents/family-community/partners-education.pdf>

For schools and districts across the United States, family engagement is rapidly shifting from a low-priority recommendation to an integral part of education reform efforts. A wide body of research demonstrates the beneficial effects of parental involvement and family-school partnerships. The various roles that families play in a child's education—as supporters of learning, encouragers of grit and determination, models of lifelong learning, and advocates of proper programming and placements for their child—are linked with indicators of student achievement: student grades, achievement test scores, lower dropout rates, students' sense of personal competence and efficacy for learning, and students' beliefs about the importance of education.

Recent work by the University of Chicago Consortium on School Research has shown that parent and community ties can have a systemic and sustained effect on learning outcomes for children and on whole-school improvement when combined with other essential supports, such as strong school leadership, a high-quality faculty, community engagement and partnerships, a student-centered learning climate, and effective instructional guidance for staff (Sebring, 2012). In particular, research shows that initiatives that take on a partnership orientation—in which student achievement and school improvement are seen as a shared responsibility, relationships of trust and respect are established between home and school, and families and school staff see one another as equal partners—create the conditions for family engagement to flourish.

Galindo, C., & Sheldon, S. B. (2012). School and home connections and children's kindergarten achievement gains: The mediating role of family involvement. *Early Childhood Research Quarterly*, 27(1), 90–103.

A child's experiences in the early years of schooling may set her or him on a learning trajectory that affects an entire school career. One way to ensure that all students succeed and graduate from high school is to ensure that they get off to a strong start. Researchers and policymakers have debated how educational disparities are intrinsically related to the home environment or to the quality of the school a child attends. This study examined the extent to which school outreach to parents and the family's involvement with the school are associated with reading and math achievement gains in kindergarten. They also considered the extent to which a family's involvement explains the relationship between school outreach and reading and math achievement. The findings support the theoretical assumptions guiding the study that the interactions of people across the home and school contexts help explain children's achievement gains in reading and math through kindergarten. The relationship can be explained only in part by the fact that family involvement at school tends to be higher in schools that implement more practices to engage families in their children's learning.

Jeynes, W. (2012). A meta-analysis of the efficacy of different types of parental involvement programs for urban students. *Urban Education*, 47(4), 706–742.

Parental involvement programs are school-sponsored initiatives that are designed to require or encourage parental participation in their children's education. The research community has clearly determined that the voluntary expression of parental involvement is strongly related to school outcomes. In contrast, social scientists can really offer no genuine consensus about the effectiveness of school-based parental involvement programs.

This meta-analysis of 51 studies examined the relationship between various kinds of parental involvement programs and the academic achievement of pre-K–12 school children. Results indicate a significant relationship between parental involvement programs overall and academic achievement, both for younger (preschool and elementary school) and older (secondary school) students as well as for four types of parental involvement programs. Parental involvement programs, as a whole, were significantly associated with higher academic achievement.

Wilder, S. (2014). Effects of parental involvement on academic achievement: A meta-synthesis. *Educational Review*, 66(3), 377–397.

The impact of parental involvement on student academic achievement has been recognized by teachers, administrators, and policymakers who consider parental involvement to be one of the integral parts of new educational reforms and initiatives. This study synthesized the results of nine meta-analyses that examined this relationship and identified generalizable findings across these studies. The results indicated that the relationship between parental involvement and academic achievement was positive, regardless of a definition of parental involvement or measure of achievement. Furthermore, the findings revealed that this relationship was strongest if parental involvement was defined as parental expectations for academic achievement of their children. However, the impact of parental involvement on student academic achievement was weakest if parental involvement was defined as homework assistance. Finally, the relationship between parental involvement and academic achievement was found to be consistent across different grade levels and ethnic groups; however, the strength of that relationship varied based on the type of assessment (standardized tests versus grade point average or teacher ratings) that was used to measure student achievement.

Epstein, J. L. (2013). Ready or not? Preparing future educators for school, family, and community partnerships. *Teaching Education*, 24(2), 115–118.

Today, teachers have students from highly diverse families that differ in size and structure; in socioeconomic, racial, linguistic, cultural, and academic backgrounds; or all of the above. Teachers, counselors, administrators, and others in schools (e.g., nurses, office workers, food specialists) must know how to communicate with all students' families in positive ways that build mutual



respect, trust, and mutual appreciation. Only in that way will all students have multiple sources of support to succeed at each grade level, plan postsecondary education, and become productive young adults.

Research overwhelmingly confirms the importance of engaging all families in their children's education. Teacher educators report that many future teachers carry unacceptable stereotypes of parents with low income, parents who speak languages other than English at home, and other traditionally underserved groups—in effect dismissing them as unimportant influences in their children's lives. Decades of surveys and studies of parents disprove these stereotypes, and practical programs in diverse communities show that, in fact, the opposite is true (Hutchins, Greenfeld, Epstein, Sanders, & Galindo, 2012).

Several authors emphasize the importance of organizing actual interactions of educators with diverse families to learn their experiences, dreams for their children, and their suggestions for useful involvement activities. New educators dramatically increase their understanding of family situations when they hear from and interact with parents who have children with special educational needs, unique talents, or who are learning more than one language, for example. As part of their training, educators should engage in role play exchanging the roles of educator and parent so that they can build strong skills in conducting two-way communications on challenging topics, such as students' scores on state tests and skills on school assessments and report cards.

Froiland, J. M., & Davison, M. L. (2014). Parental expectations and school relationships as contributors to adolescents' positive outcomes. *Social Psychology of Education, 17*(1), 1–17.

Researchers examined associations of parental expectations and parental school relationships with school outcomes among U.S. middle and high school students. Measures included interview responses about parent expectations for their children's long-term educational attainment (ranging from dropping out of high school to obtaining a J.D., Ph.D, or M.D.) and how much parents feel welcomed at school and trust and have positive interactions with educators. The latter three variables formed a latent variable called parent-school relationship. Analyses controlled for socioeconomic status (parents' educational attainment and household income), family structure, gender, and ethnicity. The school outcomes variable was derived from parental report of students' grades, retention in any grade, and behavioral problems at school.

The results of this study are in accordance with numerous other studies that parent expectations for their children's long-term educational attainment had a moderately positive relationship to positive school outcomes and had a stronger effect than socioeconomic status. Parent-school relationships were positively associated with parent's perceptions of their children's grades, promotion, and good behavior at school above and beyond the effect of family socioeconomic status and race/ethnicity. These findings suggest that



psychologists and educators should be aware of the positive potential role (e.g., via expectations and developing supportive relationships with educators) parents can play in their in middle and high school children's education.

Castro, M., Expósito-Casas, E., López-Martín, E., Lizasoain, L., Navarro-Asencio, E., & Gaviria, J. L. (2015). Parental involvement on student academic achievement: A meta-analysis. *Educational Research Review*, 14, 33–46.

These researchers conducted a quantitative synthesis of research into parental involvement and academic achievement through the meta-analysis of 37 studies in kindergarten, primary, and secondary schools carried out between 2000 and 2013. The results show that the parental models most linked to high achievement are those focusing on general supervision of the children's learning activities. The strongest associations are found when the families have high academic expectations for their children, develop and maintain communication with them about school activities, and help them to develop reading habits. These findings are consistent with the previous meta-analytical literature and suggest that the most effective modality of parent involvement has to do with accompanying and supervising children's main school goals, which are to study and to learn.

According to the researchers, other family behaviors such as supervision and control of homework and parental attendance of school activities do not appear to be especially related to the children's academic achievement. The researchers posit that the need that some children have for help with homework or for parents to participate in school activities is especially important when the child presents some kind of difficulty (either in learning, behavior, socialization, and so on) and this situation would have a negative effect on school results, even with the parents' collaboration and participation. The researchers also observed that the largest positive relation between parent participation and academic achievement is detected when global measures of academic achievement are considered and when it is estimated by standardized measures. The only exception to this corresponded to very specialized academic subjects, such as art or music.

Reynolds, A. D., Crea, T. M., Medina, J., Degnan, E., & McRoy, R. (2015). A mixed-methods case study of parent involvement in an urban high school serving minority students. *Urban Education*, 50(6), 750–775.

Parental involvement in children's education has been associated with a number of positive outcomes for students, including student achievement; self-efficacy and intrinsic motivation; and decreased negative behaviors, including truancy and dropout. There has been little research in the context of urban secondary schools to explain why parents become involved or the extent to which parents and teachers perceive involvement similarly or differently.

This study adds to the literature by examining within the context of an urban minority high school with high Latino, African American, and immigrant populations:

1. The influence of parent psychological beliefs (role construction and self-efficacy); contextual motivators (school invitations); and life-context variables, including parent demographics (race/ethnicity, parents education level, immigration status, and number of people in the home) and cultural influences on parent involvement.
2. How parent and teacher perceptions of involvement are similar and/or different from both parent and teacher perspectives.

Analysis indicated that both psychological motivators (role construction and self-efficacy) and contextual motivators (invitations) predicted involvement. This finding is of particular importance for teachers and administrators because it underscores the importance of invitations to parental involvement and that reaching out to parents can lead to higher levels of involvement.

There was an additional finding: Teacher perceptions were more strongly associated with parent involvement than parents' own perceptions were. While parents and teachers might offer different perspectives on involvement, they both identified similar barriers to more communication and involvement. Both groups mentioned the need for a systematic, organized, and institutional approach to involvement that could establish common expectations, patterns, and protocols to facilitate parent-teacher interactions.

In addition, parents wanted to hear more from teachers before it was "too late" to intervene, and many teachers admitted either that they had not been proactive in communication or had not done enough communication to prevent problems before they arose. Similarly, parents reported wanting to hear more positive examples of their child's achievement and behavior so that parent-teacher communications were not focused solely on student deficits. Correspondingly, teachers admitted needing to include more positive feedback in their communications. Last, both groups mentioned significant cultural and linguistic barriers in communications and indicated that more assistance was needed to accommodate for socio-cultural differences.

Dotterer, A. M., & Wehrspann, E. (2016). Parent involvement and academic outcomes among urban adolescents: Examining the role of school engagement. *Educational Psychology*, 36(4), 812–830.

This study examined the extent to which parent involvement in education was directly and indirectly (via school engagement) related to academic outcomes in an effort to more fully understand the school experiences of urban adolescents. School engagement has been conceptualized as a multidimensional, mediational construct that links social contexts and academic outcomes. Therefore, this investigation tested whether the links between parental involvement and academic outcomes were mediated by behavioral, emotional, and cognitive school engagement. The participants

were 108 students (80 percent racial/ethnic minority) in grades 6, 7, or 8. Data included youth-completed, in-school surveys (fall and subsequent spring) that asked questions about parental involvement in education, school engagement (affective, behavioral, cognitive engagement), and perceived academic competence. Grades were obtained from official school records.

Findings showed that parental involvement was positively associated with behavioral and cognitive engagement, which in turn contributed to academic competence and achievement. Researchers concluded that these results underscore the importance of parental involvement in adolescents' engagement and academic success and highlight the importance of examining the multiple components of school engagement simultaneously, as differential effects were found for affective, behavioral, and cognitive engagement on academic competence and achievement.

### **Criterion 8: Exhibiting collaborative and collegial practices focused on improving instructional practice and student learning.**

*Professional practice: The teacher participates collaboratively in the educational community to improve instruction, advance the knowledge and practice of teaching as a profession, and ultimately impact student learning.*

#### **Key findings**

- *The development of collegial professional practice is influenced by principal leadership and wider distributed leadership structures at the school.*
- *Teachers and schools that engage in better quality collaborations had higher achievement gains in math and reading, and teachers improve at greater rates when they work in schools with better collaboration quality.*
- *The PLC practice of teacher collaboration on the review of student work, discussions of student-centered educational issues, and providing feedback on instructional practices correlated positively with student achievement on standardized assessments.*
- *Well-connected teacher networks are associated with strong teacher collective efficacy, which in turn supports student achievement.*
- *A high degree of coherence as a team is essential to the success of the collaboration, and the strength of the collaborative team depends on the content of the collaboration.*
- *Districts and schools in their efforts to improve student learning may benefit from investing their professional development funds and resources in facilitating teacher-centered collaborative and research-based learning activities.*

Mindich, D., & Lieberman, A. (2012). *Building a learning community: A tale of two schools*. Retrieved from Stanford University, Stanford Center for Opportunity Policy in Education website: <https://edpolicy.stanford.edu/sites/default/files/publications/building-learning-community-tale-two-schools.pdf>

Education research has found that collegial work is connected to teachers' professional growth and positive student outcomes, but for various social and psychological, as well as organizational reasons, teachers often face challenges to working together. As a result, efforts to bring teachers together have had uneven success. PLCs can be an excellent vehicle for high-quality professional development. There is a good deal of research about what effective PLCs look like, but as McLaughlin and Talbert (2006) write: "We know much less about the process—how teacher learning communities get started, how they develop, and how requirements for their development and markers of maturity change" (p. 129).

In this study, researchers examined various ways to implement effective PLCs. They combined survey data of 33 New Jersey public schools involved in a state-sponsored PLC training program with case studies of two of those schools in order to trace the factors associated with the implementation of PLCs. Interviews and observations at the two case-study schools showed that a set of predicted variables—vision, community, resources (including time to meet and teacher expertise), and processes—seemed to be connected to the development of collegial professional practice and that all of these factors were influenced by principal leadership and the wider distributed leadership structures at the schools. These findings were corroborated by the survey data from the two case-study schools and the larger pool of schools in the program.

Other factors—such as the state and local contexts of the two case-study schools and the leaders' judicious use of their means of control while also supporting teacher autonomy—proved to be important for these schools as well. Although the staffs at both schools were already close socially and professionally, schools with even reluctant teachers noticed greater depth to their collegial work. Challenges remained in terms of scheduling among teachers and the use of data to support high-quality teaching, but the move from congeniality to collegiality could be documented.

Ronfeldt, M., Farmer, S. O., McQueen, K., & Grissom, J. A. (2015). Teacher collaboration in instructional teams and student achievement. *American Educational Research Journal*, 52(3), 475–514.

As the push to create communities of practice in schools takes hold, understanding the increasingly collaborative nature of teachers' work takes on heightened importance. This study describes that work and investigates how it varies by school context and teacher characteristics. It also sheds light on how teacher collaboration contributes to teacher improvement and student achievement.

These researchers drew from survey and administrative data on more than 9,000 teachers in 336 Miami-Dade County public schools over two years. They investigated the kinds of collaborations that existed in instructional teams across the district and whether these collaborations predicted student achievement. While different kinds of teachers and schools reported different collaboration quality, researchers found collaboration quality was related to student achievement. Teachers and schools that engaged in better quality

collaboration had higher achievement gains in math and reading. Moreover, teachers improved at greater rates when they worked in schools with better collaboration quality. These results support policy efforts to improve student achievement by promoting teacher collaboration about instruction in teams.

Looking across analyses, results suggest that collaboration in instructional teams is associated with gains in both teacher and student growth. Schools and teachers that have better quality collaboration across instructional domains also have higher achievement gains, and usually at statistically significant and meaningful levels. Results are less clear when asking, “Does collaboration about some instructional practices affect student achievement more than collaboration about others?” The answer to this question seems to vary somewhat by subject area (reading or math) and by modeling approach. However, collaboration about assessment was most often significantly predictive of achievement gains across math and reading. In reading, collaboration about instructional strategies and curriculum also predicted achievement gains.

Ratts, R. F., Pate, J. L., Archibald, J. G., Andrews, S. P., Ballard, C. C., & Lowney, K. S. (2015). The influence of professional learning communities on student achievement in elementary schools. *Journal of Education & Social Policy*, 2(4), 51–61.

Researchers and professional organizations have cited the PLC process as having the potential to impact student achievement in a positive manner. As the current era of high-stakes accountability has left teachers struggling to improve the quality of teaching and learning, PLCs have been recommended to foster collaboration and share teacher practices. Therefore, a quantitative research design was implemented to explore the extent to which teacher training in PLC principles, the actual practice of PLC principles, and student achievement as measured by standardized assessments were related.

The researchers used a survey to collect data regarding 194 teachers’ perceptions of the existence of four dimensions of PLCs within their schools. They also examine four years of criterion-referenced competency test data to measure student achievement and used descriptive and inferential statistics to look for possible relationships among the factors. Statistical examination indicated that PLC members who observed peers, provided feedback on instructional practices, worked with colleagues to gauge student work quality, and collaboratively reviewed student work through data analysis were more likely to improve their quality of teaching. Further results indicated positive correlations between teacher level of education and observing peers and between level of education and providing feedback on instructional practices. Positive correlations were also identified between student achievement on standardized assessments and teacher practice of collaboratively reviewing student work and discussing student-centered educational issues.

Moolenaar, N. M., Sleegers, P. J., & Daly, A. J. (2012). Teaming up: Linking collaboration networks, collective efficacy, and student achievement. *Teaching and Teacher Education*, 28(2), 251–262.

Improving student achievement through teacher collaboration networks is a current focus of schools in many countries. Yet, empirical evidence on the relationship between teacher networks and student achievement and mechanisms that may explain this relationship is limited. This study examined the relationship between teacher networks and student achievement and the mediating role of teachers' collective efficacy beliefs. Data were collected from 53 Dutch elementary schools. Using social network analysis and multiple regression methodology, these researchers analyzed teacher survey and student achievement data. Findings indicate that well-connected teacher networks were associated with strong teacher collective efficacy, which in turn supported student achievement.

School leadership may increase collective efficacy beliefs by increasing teachers' perceptions of their individual and shared ability to successfully manage tasks by creating the opportunities for teachers to succeed at achieving desired goals (creating mastery experience) and for colleagues to witness and share this success and active role modeling (Bandura, 1997). A potential route to school improvement, therefore, may be to grow strong ties among teachers, cultivate their collective beliefs, and as a result harvest increased student achievement.

Vangrieken, K., Dochy, F., Raes, E., & Kyndt, E. (2015). Teacher collaboration: A systematic review. *Educational Research Review*, 15, 17–40.

Educators are facing increasing pressure toward collaboration. It is becoming a widely held belief that teachers need to be proficient collaborators in order to successfully perform their job. There are different reasons for this evolution, and the fact that teamwork is a phenomenon of growing importance in society overall is one of the contributing factors. A collaborative work environment seems to become the norm for every organization (Edmonson, 2013). This paper presents a systematic review of teacher collaboration focused on terminology used, focus and depth of collaboration, positive and negative consequences, facilitating and hindering factors, and qualities of effective collaboration.

In total, 82 studies were selected based on the predefined selection criteria and reviewed by means of a narrative review method to thematically gather information across the studies. Collaboration was perceived here as a continuum ranging from mere aggregates of individuals to strong team collaboration. This continuum was conceptualized as the degree of team entitativity (i.e., a group considered to be one entity rather than many individual entities). The findings were as follows:

1. Different terms were used to refer to teacher collaboration, and they were often vaguely defined and used interchangeably. It can be questioned whether the terms refer to the same or different forms of teacher collaboration, making it difficult to draw warranted conclusions from current literature.



2. The focus of teacher collaboration can be diverse and can take different depths, ranging from mere superficial to deep-level collaboration. The long-standing culture of teacher isolation and individualism, together with teachers' preference to preserve their individual autonomy, may hinder deep-level collaboration.
3. Teacher collaboration pays off for students and teachers as well as at the whole school level. When teachers collaborate, student educational performance progresses and schools undergo cultural changes, becoming more innovative and characterized by a flattened power structure. Teachers appear to profit most from collaboration: Their job performance not only progresses, but on a personal level, their morale is higher and they tend to feel less isolated and more motivated. Researchers suggest that these positive consequences reflect a growth mindset perspective on teacher collaboration—as the performance of students and teachers increase, collaboration becomes increasingly desirable.
4. A diverse array of factors influences teacher collaboration. There are thus ample points of action for interventions focused at making teacher collaboration successful. Most of the facilitating factors were identified at the process level. This means that in order to make teacher collaboration successful, a lot of actions can be undertaken to support varying aspects of the collaborative process, for example: realizing task interdependence, developing clear roles for the members, and defining the focus for collaboration. Also, structural supports, such as providing meeting time and group-level interventions mainly focused on group composition seem to be important points of action to facilitate teacher collaboration.

In studying teacher collaboration, all aspects must be considered from practical room arrangements to creating space for deeper discussion on classroom practice. These entail different forms and depths of collaboration and, accordingly, different degrees of team entitativity. A high degree of coherence as a team is essential to the success of the collaboration, and the strength of the collaborative team depends on the content of the collaboration.

Akiba, M., & Liang, G. (2016). Effects of teacher professional learning activities on student achievement growth. *Journal of Educational Research*, 109(1), 99–110.

The authors examined the effects of six types of teacher professional learning activities on student achievement growth over four years. They used statewide longitudinal survey data collected from 467 middle school mathematics teachers in 91 schools merged with 11,192 middle school students' mathematics scores on a standardized state assessment. The data showed that teacher-centered collaborative activities to learn about mathematics teaching and learning, such as teacher collaboration and informal communication, seem to be more effective in improving student mathematics achievement than learning activities that do not necessarily involve such teacher-centered collaborative opportunities, such as professional development programs,



university courses, and individual learning activities. Teacher-driven research activities through professional conference presentation and participation were also found to be associated with student achievement growth in mathematics. Researchers conclude that districts and schools, in their efforts to improve student learning, may benefit from investing their professional development funds and resources in facilitating teacher-centered collaborative and research-based learning activities.

## Conclusion

Several questions emerge when reviewing the research base on effective teaching practices, Washington's eight teacher evaluation criteria, and the instructional frameworks upon which they are based:

- How do educators “know” effective practices when they see them?
- Do educators agree on what they see?
- Do educators use a common language to discuss what has been observed or practiced?
- What supports are necessary to ensure educators implement and sustain the practices known to be effective?

To answer these questions to the satisfaction of teachers and administrators who are challenged with providing evidence of the implementation of effective teaching practices, the following ground rules should be established:

1. Teachers and administrators should agree on the research-based criteria that are accepted as evidence of effective practices, as well as the supports they require.
2. Teachers and administrators should use a common language to describe and implement the agreed-upon effective teaching practices.
3. Teachers and administrators should have a mutual understanding that full implementation of effective practices occurs over time.
4. Teachers and administrators should agree on when and what to assess over the course of the implementation.

## Bibliography

- Akiba, M., & Liang, G. (2016). Effects of teacher professional learning activities on student achievement growth. *Journal of Educational Research*, 109(1), 99–110.
- Allen, J., Gregory, A., Mikami, A., Lun, J., Hamre, B., & Pianta, R. (2013). Observations of effective teacher-student interactions in secondary school classrooms: Predicting student achievement with the Classroom Assessment Scoring System—Secondary. *School Psychology Review*, 42(1), 76–98.
- Ball, C. R., Finch, W. H., & Gettinger, M. (2014). Classroom-level effects on the reading and behavior of at-risk kindergarteners. *Preventing School Failure*, 58(2), 80–89.
- Bandura, A. (1997). *Self-efficacy: The exercise of control*. New York, NY: W. H. Freeman.
- Barry, R. A. (2010). *Teaching effectiveness and why it matters*. Retrieved from Chalkboard Project website: <http://chalkboardproject.org/sites/default/files/teacher-effectiveness-and-why-it-matters.pdf>
- Bertrand, M., & Marsh, J. A. (2015). Teachers' sensemaking of data and implications for equity. *American Educational Research Journal*, 52(5), 861–893.
- Castro, M., Expósito-Casas, E., López-Martín, E., Lizasoain, L., Navarro-Asencio, E., & Gaviria, J. L. (2015). Parental involvement on student academic achievement: A meta-analysis. *Educational Research Review*, 14, 33–46.
- Charalambous, C. Y., & Hill, H. C. (2012). Teacher knowledge, curriculum materials, and quality of instruction: Unpacking a complex relationship. *Journal of Curriculum Studies*, 44(4), 443–466.
- Coburn, C. E., & Turner, E. O. (2011). Research on data use: A framework and analysis. *Measurement: Interdisciplinary Research and Perspectives*, 9(4), 173–206.
- Coburn, C. E., & Turner, E. O. (2012). The practice of data use: An introduction. *American Journal of Education*, 118(2), 99–111.

- Connor, C. M., Spencer, M., Day, S. L., Giuliani, S., Ingebrand, S. W., McLean, L., & Morrison, F. J. (2014). Capturing the complexity: Content, type, and amount of instruction and quality of the classroom learning environment synergistically predict third graders' vocabulary and reading comprehension outcomes. *Journal of Educational Psychology*, 106(3), 762–778.
- Danielson, C. (1996). *Enhancing professional practice: A framework for teaching*. Alexandria, VA: Association for Supervision and Curriculum Development.
- Danielson, C. (2009). *Talk about teaching: Leading professional conversations*. Thousand Oaks, CA: Corwin Press.
- Datnow, A., Park, V., & Kennedy-Lewis, B. (2012). High school teachers' use of data to inform instruction. *Journal of Education for Students Placed at Risk*, 17(4), 247–265.
- Dean, C. B., Hubbell, E. R., Pitler, H., & Stone, B. J. (2012). *Classroom instruction that works: Research-based strategies for increasing student achievement* (2nd ed.). Alexandria, VA: ASCD.
- Dotterer, A. M., & Wehrspann, E. (2016). Parent involvement and academic outcomes among urban adolescents: Examining the role of school engagement. *Educational Psychology*, 36(4), 812–830.
- Edmondson, A. C. (2013). *Teaming to innovate*. San Francisco, CA: Jossey-Bass.
- Epstein, J. L. (2013). Ready or not? Preparing future educators for school, family, and community partnerships. *Teaching Education*, 24(2), 115–118.
- Farrell, C. C., & Marsh, J. A. (2016). Metrics matter: How properties and perceptions of data shape teachers' instructional responses. *Educational Administration Quarterly*, 52(3), 423–462.
- Friedrich, A., Flunger, B., Nagengast, B., Jonkmann, K., & Trautwein, U. (2015). Pygmalion effects in the classroom: Teacher expectancy effects on students' math achievement. *Contemporary Educational Psychology*, 41, 1–12.
- Froiland, J. M., & Davison, M. L. (2014). Parental expectations and school relationships as contributors to adolescents' positive outcomes. *Social Psychology of Education*, 17(1), 1–17.

- Galindo, C., & Sheldon, S. B. (2012). School and home connections and children's kindergarten achievement gains: The mediating role of family involvement. *Early Childhood Research Quarterly*, 27(1), 90–103.
- Gilbert, M. C., Musu-Gillette, L. E., Woolley, M. E., Karabenick, S. A., Strutchens, M. E., & Martin, W. G. (2014). Student perceptions of the classroom environment: Relations to motivation and achievement in mathematics. *Learning Environments Research*, 17(2), 287–304.
- Goodwin, B. (2010). *Changing the odds for student success: What matters most*. Denver, CO: Mid-continent Research for Education and Learning.
- Guo, Y., Connor, C. M., Yang, Y., Roehrig, A. D., & Morrison, F. J. (2012). The effects of teacher qualification, teacher self-efficacy, and classroom practices on fifth graders' literacy. *Elementary School Journal*, 113(1), 3–24.
- Hattie, J. (2009). *Visible learning: A synthesis of 800 meta-analyses related to achievement*. New York, NY: Routledge.
- Hattie, J. (2012). *Visible learning for teachers: Maximizing impact on learning*. New York, NY: Routledge.
- Hutchins, D. J., Greenfeld, M. D., Epstein, J. L., Sanders, M. G., & Galindo, C. L. (2012). *Multicultural partnerships: Involve all families*. New York, NY: Eye on Education.
- Jeynes, W. (2012). A meta-analysis of the efficacy of different types of parental involvement programs for urban students. *Urban Education*, 47(4), 706–742.
- Jimerson, J. B., & Wayman, J. C. (2015). Professional learning for using data: Examining teacher needs and supports. *Teachers College Record*, 117(4), 1–36.
- Mandinach, E. B., Parton, B. M., Gummer, E. S., & Anderson, R. (2015). Ethical and appropriate data use requires data literacy. *Phi Delta Kappan*, 96(5), 25–28.
- Mapp, K. L., & Kuttner, J. P. (2013). *Partners in education: A dual capacity-building framework for family-school partnerships*. Retrieved from U.S. Department of Education website: <http://www2.ed.gov/documents/family-community/partners-education.pdf>

- Marzano, R. J. (2007). *The art and science of teaching: A comprehensive framework for effective instruction*. Alexandria, VA: Association for Supervision and Curriculum Development.
- McLaughlin, M. W., & Talbert, J. E. (2006). *Building school-based teacher learning communities: Professional strategies to improve student achievement*. New York, NY: Teachers College Press.
- Mindich, D., & Lieberman, A. (2012). *Building a learning community: A tale of two schools*. Retrieved from Stanford University, Stanford Center for Opportunity Policy in Education website: <https://edpolicy.stanford.edu/sites/default/files/publications/building-learning-community-tale-two-schools.pdf>
- Moolenaar, N. M., Slegers, P. J., & Daly, A. J. (2012). Teaming up: Linking collaboration networks, collective efficacy, and student achievement. *Teaching and Teacher Education*, 28(2), 251–262.
- Muijs, D., Kyriakides, L., van der Werf, G., Creemers, B., Timperley, H., & Earl, L. (2014). State of the art—teacher effectiveness and professional learning. *School Effectiveness and School Improvement*, 25(2), 231–256.
- Parsons, S. A., Dodman, S. L., & Burrowbridge, S. C. (2013). Broadening the view of differentiated instruction. *Phi Delta Kappan*, 95(1), 38–42.
- Ratts, R. F., Pate, J. L., Archibald, J. G., Andrews, S. P., Ballard, C. C., & Lowney, K. S. (2015). The influence of professional learning communities on student achievement in elementary schools. *Journal of Education & Social Policy*, 2(4), 51–61.
- Reyes, M. R., Brackett, M. A., Rivers, S. E., White, M., & Salovey, P. (2012). Classroom emotional climate, student engagement, and academic achievement. *Journal of Educational Psychology*, 104(3), 700–712.
- Reynolds, A. D., Crea, T. M., Medina, J., Degnan, E., & McRoy, R. (2015). A mixed-methods case study of parent involvement in an urban high school serving minority students. *Urban Education*, 50(6), 750–775.
- Roffey, S. (2015). Becoming an agent of change for school and student well-being. *Educational & Child Psychology*, 32(1), 21–30.
- Ronfeldt, M., Farmer, S. O., McQueen, K., & Grissom, J. A. (2015). Teacher collaboration in instructional teams and student achievement. *American Educational Research Journal*, 52(3), 475–514.

- Rosenshine, B. (2012). Principles of instruction: Research-based strategies that all teachers should know. *American Educator*, 36(1), 12–19, 39.
- Sadler, P. M., Sonnert, G., Coyle, H. P., Cook-Smith, N., & Miller, J. L. (2013). The influence of teachers' knowledge on student learning in middle school physical science classrooms. *American Educational Research Journal*, 50(5), 1020–1049.
- Schifter, C. C., Natarajan, U., Ketelhut, D. J., & Kirchgessner, A. (2014). Data-driven decision making: Facilitating teacher use of student data to inform classroom instruction. *Contemporary Issues in Technology and Teacher Education*, 14(4), 419–432.
- Schwarz, K. A., Pfister, R., & Büchel, C. (2016). Rethinking explicit expectations: Connecting placebos, social cognition, and contextual perception. *Trends in Cognitive Sciences*, 20(6), 469–480.
- Sebring, P. B. (2012, March). *Community social capital and school improvement*. Paper presented at the National Community and School Reform Conference at Harvard Graduate School of Education, Cambridge, MA.
- Sparks, S. D. (2015, January 28). Differentiated instruction: A primer. *Education Week*, 34(20). Retrieved from [http://www.edweek.org/ew/articles/2015/01/28/differentiated-instruction-a-primer.html?qs=January+28,+2015+inmeta:Cover\\_year%3D2015](http://www.edweek.org/ew/articles/2015/01/28/differentiated-instruction-a-primer.html?qs=January+28,+2015+inmeta:Cover_year%3D2015)
- Tomlinson, C. A. (2003). *Fulfilling the promise of the differentiated classroom: Strategies and tools for responsive teaching*. Alexandria, VA: Association for Supervision and Curriculum Development.
- Tomlinson, C. A. (2014). *The differentiated classroom: Responding to the needs of all learners* (2nd ed.). Alexandria, VA: ASCD.
- Trautwein, U., & Möller, J. (2016). Self-concept: Determinants and consequences of academic self-concept in school contexts. In A. A. Lipnevich, F. Preckel, & R. D. Roberts (Eds.), *Psychosocial skills and school systems in the 21st century: Theory, research, and practice* (pp. 187–214). New York, NY: Springer International.
- University of Washington, Center for Educational Leadership. (2012). 5 *Dimensions of Teaching and Learning™: Instructional framework version 4.0*. Retrieved from [http://info.k-12leadership.org/5-dimensions-of-teaching-and-learning?\\_ga=1.74459858.1124502260.1445903300](http://info.k-12leadership.org/5-dimensions-of-teaching-and-learning?_ga=1.74459858.1124502260.1445903300)



Van Driel, J. H., & Berry, A. (2012). Teacher professional development focusing on pedagogical content knowledge. *Educational Researcher*, 41(1), 26–28.

Vangrieken, K., Dochy, F., Raes, E., & Kyndt, E. (2015). Teacher collaboration: A systematic review. *Educational Research Review*, 15, 17–40.

Wilder, S. (2014). Effects of parental involvement on academic achievement: A meta-synthesis. *Educational Review*, 66(3), 377–397.

## Additional Resources (2009–2016)

### Effective teaching

Moolenaar, N. M. (2012). A social network perspective on teacher collaboration in schools: Theory, methodology, and applications. *American Journal of Education*, 119(1), 7–39.

Moore, K. D. (2015). *Effective instructional strategies: From theory to practice* (4th ed.). Thousand Oaks, CA: SAGE.

Orlich, D. C., Harder, R. J., Callahan, R. C., Trevisan, M. S., Brown, A. H., & Miller, D. E. (2013). *Teaching strategies: A guide to effective instruction* (10th ed.). Belmont, CA: Wadsworth, Cengage Learning.

Waxman, H. C., Weber, N. D., Franco-Fuenmayor, S. E., & Rollins, K. B. (2015). Research-based approaches for identifying and assessing effective teaching practices: Challenges, new directions, and policy implication. In Y. Li & J. Hammer (Eds.), *Teaching at work* (pp. 9–27). Retrieved from Sense Publishers website: <https://www.sensepublishers.com/media/2345-teaching-at-work.pdf>

### Differentiation

Gregory, G. H., & Chapman, C. (2013). *Differentiated instructional strategies: One size doesn't fit all* (3rd ed.). Thousand Oaks, CA: Corwin.

Gregory, G. H., & Kuzmich, L. (2014). *Data driven differentiation in the standards-based classroom* (2nd ed.). Thousand Oaks, CA: Corwin.

Magee, M., & Breaux, E. (2010). *How the best teachers differentiate instruction*. Larchmont, NY: Eye on Education.

Waterman, S. S. (2013). *Handbook on differentiated instruction for middle & high schools*. New York, NY: Routledge.

### **Content knowledge**

Loughran, J. (2010). *What expert teachers do: Enhancing professional knowledge for classroom practice*. New York, NY: Routledge.

Moore, K. D. (2015). *Effective instructional strategies: From theory to practice* (4th ed.). Thousand Oaks, CA: SAGE.

Orlich, D. C., Harder, R. J., Callahan, R. C., Trevisan, M. S., Brown, A. H., & Miller, D. E. (2013). *Teaching strategies: A guide to effective instruction* (10th ed.). Belmont, CA: Wadsworth, Cengage Learning.

### **Learning environment**

Emmer, E. T., & Evertson, C. M. (2013). *Classroom management for middle and high school teachers* (9th ed.). Boston, MA: Pearson.

Jones, V., & Jones, L. (2015). *Comprehensive classroom management: Creating communities of support and solving problems* (11th ed.). Boston, MA: Pearson.

### **Assessment-data use**

Gummer, E., & Mandinach, E. (2015). *Building a conceptual framework for data literacy*. *Teachers College Record*, 117(4), 1–22.

Mandinach, E. B. (2012). A perfect time for data use: Using data-driven decision making to inform practice. *Educational Psychologist*, 47(2), 71–85.

Mandinach, E., & Gummer, E. (2015). Data-driven decision making: Components of the enculturation of data use in education. *Teachers College Record*, 117(4), 1–12.

Mandinach, E. B., & Gummer, E. S. (2016). *Data literacy for educators: Making it count in teacher preparation and practice*. New York, NY: Teachers College Press.

Mandinach, E. B., & Jackson, S. S. (2012). *Transforming teaching and learning through data-driven decision making*. Thousand Oaks, CA: Corwin.

### **Families and community**

Booth, A., & Dunn, J. F. (Eds.). (2009). *Family-school links: How do they affect educational outcomes?* New York, NY: Routledge, Taylor & Francis.

## To learn more



Basha Krasnoff  
Basha.Krasnoff@educationnorthwest.org  
Research and Development Advisor  
503.275.9624



Melinda Leong  
Melinda.Leong@educationnorthwest.org  
NWCC Washington State Coordinator  
503.275.9172



Mike Siebersma  
Mike.Siebersma@educationnorthwest.org  
NWCC Director  
503.275.9642

### About the Northwest Comprehensive Center

The Northwest Comprehensive Center (NWCC), operated by Education Northwest, is one of the nation's 15 regional Comprehensive Centers. Funded by the U.S. Department of Education, the NWCC provides high-impact training and technical assistance to state education agencies in the Northwest states of Alaska, Idaho, Montana, Oregon, and Washington. Our work focuses on the priorities of educator effectiveness, school improvement, and Common Core State Standards implementation.

Education Northwest is a nonprofit, nonpartisan organization headquartered in Portland, Oregon, that's dedicated to transforming teaching and learning. Our services to states, districts, schools, community-based organizations, and foundations include rigorous research and evaluation; research-based technical assistance; widely acclaimed professional development; and strategic communications that maximize impact.

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