“Graves and Fitzgerald (2003) note “effective instruction often follows a progression in which teachers gradually do less of the work and students gradually assume increased responsibility for their learning. It is through this process of gradually assuming more and more responsibility for their learning that students become competent, independent learners” (p. 98).”
Douglas Fisher + Nancy Frey

“The effectiveness of peer learning has been demonstrated with English language learners (Gersten & Baker, 2000), students with disabilities (Stevens & Slavin, 1995), and learners identified as gifted (Coleman & Gallagher, 1995). While the effectiveness of peer learning has been documented, it has typically been examined as a singular practice, isolated from the overall instructional design of the lesson.”
Douglas Fisher + Nancy Frey

“As Fullan, Hill, and Crévola (2006) note, we don’t need more prescriptive teaching, but rather more precision in our teaching. Precision teaching requires that teachers know their students and content well, that they regularly assess students’ understanding of the content, and that they purposefully plan lessons that transfer responsibility from the teacher to the student. It is through this very purposeful classroom structure that learning occurs.”
Douglas Fisher + Nancy Frey

“... formative assessments alone do little to improve student learning or teaching quality. What really counts is what happens after the assessments... to improve student learning these regular progress checks must provide feedback (identifying students' individual learning difficulties) and be followed up with correctives (specific remediation strategies).... correctives will be effective only if they are qualitatively different from the original instruction.”
Guskey

“When educators believe students are competent, students tend to perform better; conversely, when educators believe students have deficits, students tend to perform more poorly.” Eric Jensen

“Learners need endless feedback more than they need endless teaching.” Grant Wiggins

“Cooperative learning is most powerful after the students have acquired sufficient surface knowledge to then be involved in discussion and learning with their peers – usually in some structured manner. It is then most useful for learning concepts, verbal problem-solving, categorizing, spatial problem-solving, retention and memory, and guessing”

– **John A.C. Hattie, Visible Learning for Teachers: Maximizing Impact on Learning**

“My role, as teacher, is to evaluate the effect I have on my students.”

– **John A.C. Hattie, Visible Learning for Teachers: Maximizing Impact on Learning**

[I]n solving problems, transfer is facilitated by instruction that helps learners develop deep understanding of the structure of a problem domain and applicable solution methods, but is not supported by rote learning of solutions to specific problems or problem-solving procedures. This kind of deep, well-integrated learning develops gradually and takes time, but it can be started early: recent evidence indicates that even preschool and early elementary students can make meaningful progress in conceptual organization, reasoning, problem solving, representation, and communication in well-chosen topic areas in science, mathematics, and language arts. In addition, teaching that emphasizes the conditions for applying a body of factual or procedural knowledge also facilitates transfer.

National Research Council. (2012). Education for Life and Work: Developing Transferable Knowledge and Skills in the 21st Century. Committee on Defining Deeper Learning and 21st Century Skills, James W. Pellegrino and Margaret L. Hilton, Editors. Board on Testing and Assessment and Board on Science Education, Division of Behavioral and Social Sciences and Education. Washington, DC: The National Academies Press.

Studies of metacognition have shown that people who monitor their own understanding during the learning phase of an experiment show better recall performance when their memories are tested (Nelson, 1996). Similar metacognitive strategies distinguish stronger from less competent learners. Strong learners can explain which strategies they used to solve a problem and why, while less competent students monitor their own thinking sporadically and ineffectively and offer incomplete explanations (Chi et al, 1989; Chi and VanLehn, 1991). There is ample evidence that metacognition develops over the school years; for example, older children are better than younger ones at planning for tasks they are asked to do (Karmiloff- Smith, 1979). Metacognitive skills can also be taught. For example, people can learn mental devices that help them stay on task, monitor their own progress, reflect on their strengths and weaknesses, and self-correct errors.

National Research Council. (2012). Education for Life and Work: Developing Transferable Knowledge and Skills in the 21st Century. Committee on Defining Deeper Learning and 21st Century Skills, James W. Pellegrino and Margaret L. Hilton, Editors. Board on Testing and Assessment and Board on Science Education, Division of Behavioral and Social Sciences and Education. Washington, DC: The National Academies Press.

[I]t is worth noting that recent research on teaching and learning reveals that young children are capable of surprisingly sophisticated thinking and reasoning in science, mathematics, and other domains (National Research Council, 2012; National Research Council, 2009c). With carefully designed guidance and instruction, they can begin the process of deeper learning and development of transferable knowledge as early as preschool. As noted in chapters 4 and 5, this process takes time and extensive practice over many years, suggesting that instruction for transfer should be introduced in the earliest grades and should be sustained throughout the K–12 years as well as in postsecondary education.

National Research Council. (2012). Education for Life and Work: Developing Transferable Knowledge and Skills in the 21st Century. Committee on Defining Deeper Learning and 21st Century Skills, James W. Pellegrino and Margaret L. Hilton, Editors. Board on Testing and Assessment and Board on Science Education, Division of Behavioral and Social Sciences and Education. Washington, DC: The National Academies Press.

Learners of all ages are more motivated when they can see the usefulness of what they are learning and when they can use that information to do something that has an impact on others— especially their local community (McCombs, 1996; Pintrich and Schunk, 1996). Sixth graders in an inner-city school were asked to explain the highlights of their previous year in fifth grade to an anonymous interviewer, who asked them to describe anything that made them feel proud, successful, or creative (Barron et al., 1998). Students frequently mentioned projects that had strong social consequences, such as tutoring younger children, learning to make presentations to outside audiences, designing blueprints for playhouses that were to be built by professionals and then donated to preschool programs, and learning to work effectively in groups. Many of the activities mentioned by the students had involved a great deal of hard work on their part: for example, they had had to learn about geometry and architecture in order to get

the chance to create blueprints for the playhouses, and they had had to explain their blueprints to a group of outside experts who held them to very high standards.
Bransford, John D., Ann L. Brown and Rodney R. Cocking, editors (2000). How People Learn: Brain, Mind, Experience, and School. Washington, D.C.: National Academies Press

One aspect of previous knowledge that is extremely important for understanding learning is cultural practices that support learners' prior knowledge. Effective teaching supports positive transfer by actively identifying the relevant knowledge and strengths that students bring to a learning situation and building on them. Transfer from school to everyday environments is the ultimate purpose of schoolbased learning. An analysis of everyday environments provides opportunities to rethink school practices in order to bring them into alignment with the requirements of everyday environments. But it is important to avoid instruction that is overly dependent on context. Helping learners choose, adapt, and invent tools for solving problems is one way to facilitate transfer while also encouraging flexibility. Finally, a metacognitive approach to teaching can increase transfer by helping students learn about themselves as learners in the context of acquiring content knowledge. One characteristic of experts is an ability to monitor and regulate their own understanding in ways that allows them to keep learning adaptive expertise: this is an important model for students to emulate.
Bransford, John D., Ann L. Brown and Rodney R. Cocking, editors (2000). How People Learn: Brain, Mind, Experience, and School. Washington, D.C.: National Academies Press

"Deeper learning happens when students must regularly transfer and construct new knowledge through disciplined inquiry. The second phase of curriculum redesign entails systematically embedding increasingly challenging learning tasks at all grade levels. These may take the form of multi-faceted projects or extended performance tasks, but they should force students to think critically and creatively about content and give them time to do so. Useful resources for designing and evaluating such tasks include: Newmann, King, and Carmichael's (2007) framework for authentic intellectual work; various models for examining the demands of cognitive rigor (Hess, Carlock, Jones, & Walkup, 2009; Paige, Sizemore, & Neace, 2013); and research-based learning progressions that outline how individuals develop content expertise over time and how to design tasks that reflect that development (Bechard, Hess, Camacho, Russell, & Thomas, 2012; Corcoran, Mosher, & Rogat, 2009; Daro, Mosher, & Corcoran, 2011; Duschl, Schweingruber, & Shouse, 2007; Hess, 2010; Hess, 2011; Hill, 2001; Masters & Forster, 1996; NRC, 2012b; Wilson & Bertenthal, 2005)."
—Hess, K., Gong, B., & Steinitz, R. (2014). *Ready for college and career? Achieving the Common Core Standards and beyond through deeper, student-centered learning*. Boston, MA: Jobs for the Future.

"There is an extensive body of research showing that students will persevere more in the face of challenge when tasks have value for them—they find them interesting or see them as serving short- or long-term goals that are important to them. Students may need support in knowing how to connect the dots between the work they are doing and the purposes it may serve in their lives, or support in discovering and fostering interests."
—Shechtman, N., DeBarger, A. H., Dornsife, C., Rosier, S., & Yarnall, L. (2013). *Promoting Grit, Tenacity, and Perseverance: Critical Factors for Success in the 21st Century*. Washington, DC: U.S. Department of Education.

“Providing opportunities for students to personalize the learning objectives identified by the teacher can increase their motivation for learning (Brophy, 2004; Morgan, 1985; Page-Voth & Graham, 1999). Students feel a greater sense of control over what they learn when they can identify how the learning is relevant to them. In addition, this practice helps students develop self-regulation (Bransford, Brown, & Cocking, 2000). Students who are skilled at self-regulation are able to consciously set goals for their learning and monitor their understanding and progress as they engage in a task. They also can plan appropriately, identify and use necessary resources, respond appropriately to feedback, and evaluate the effectiveness of their actions. Acquiring these skills helps students become independent lifelong learners.”
—Dean, C. B., Hubbell, E. R., Pitler, H., & Stone, B. (2012). *Classroom instruction that works: Research-based strategies for increasing student achievement*. Alexandria, VA: Association for Supervision and Curriculum Development.

“Research has repeatedly demonstrated that student motivation and achievement are maximized when learning targets and standards are high but attainable (Crooks, 1988). In many instances, however, this is not possible if all students are working simultaneously on the same tasks and trying to meet the same targets (Crooks, 1988). Thus, it is also important that assessment be aligned to the needs of individual children in order that each child is appropriately challenged (Brimijoin et al., 2003). Consistent with this notion, studies have shown that student learning is enhanced when the material is taught at students’ individual readiness levels, connected with their interests, and presented according to their strongest learning styles (Crooks, 1988).”
—lark, T., Englert, K., Frazee, D., Shebby, S. & Randel, B. (2009). *Assessment: A McREL report prepared for Stupski Foundation’s Learning System*. Denver, CO: Mid-continent Research for Education and Learning.