6. Personalize coaching by being mindful of individual profiles (ability and personality).
7. Provide ongoing feedback and immediate opportunities to use it.
8. Provide just-in-time teaching in small focused doses.
9. Adjust plans in light of unexpected or inappropriate results.
10. Strive to make learners autonomous, thus making self-assessment and self-adjustment a key goal.

Such practices are not restricted to athletics, the arts, and extracurricular activities; they are applicable in any teaching situation in which transfer is the goal.

Thus far, I have discussed facilitative teaching to help students actively make meaning (in other words, come to understand meaning) and coaching for transfer. You might be asking, where then is the place for direct instruction? Of course, there is a role for explicit teaching, especially to help students acquire needed knowledge, skills, and strategies. But direct instruction need not be the starting point, as Bransford et al. (2000) note in *How People Learn*:

> A common misconception regarding "constructivist" theories of knowing is that teachers should never tell students anything directly but instead should always allow them to construct knowledge for themselves. This perspective confuses a theory of pedagogy (teaching) with a theory of knowing. There are times, usually after people have first grappled with issues on their own, that "teaching by telling" can work extremely well. (p. 11)

We can summarize the instructional implications of teaching for understanding and transfer as follows: when the learning goal is to ensure that ideas are understood and misconceptions overcome, *facilitate* active processing of information and student inquiry so that learners *make meaning* for themselves. When

the aim is for the learner to *transfer* knowledge and skills to new specific situations, then *coach* for the desired performances. When students need to *acquire* specific knowledge, skill, and strategies (especially in the context of meaningful performance), *direct* instruction is in order (Wiggins & McTighe, 2008).

6. Provide Opportunities for Students to Rethink, Revise, and Retry Based on Feedback

Sixth-grade students are learning watercolor painting techniques. The art teacher models proper technique for mixing and applying the colors, and the students begin working. As they paint, the teacher provides feedback both to individual students and to the class as a whole. She targets common mistakes, such as using too much paint and not enough water, a practice that reduces the desired transparency effect. Benefiting from continual feedback from the teacher, students experiment with the medium on sheets of paper. The next class provides additional opportunities to apply various watercolor techniques to achieve such effects as color blending and soft edges.

As a culminating performance task for a high school government course, the teacher has students work in teams to investigate a current issue in the community or state, and then write a letter to a policymaker (such as a city council member or state delegate) advocating a particular position on the issue. He provides students with exemplary letters from previous classes to illustrate the qualities of an effective position paper. Students discuss and debate the issues as a means of helping them clarify their thinking before drafting their letters. The drafts are then circulated among the teams for peer review. The teacher also gives specific feedback on the drafts and provides time for revision before the letters are mailed.

The "R" in WHERE acknowledges the fact that a learner will rarely achieve in-depth understanding of an abstract idea on the first encounter; rather, the learner will need to *rethink*, *revise*, and *retry*. The phrase *come to an understanding* suggests that comprehension is a process, occurring over time. Similarly, few

people can produce a perfect product or flawless performance on the first try. We need feedback and opportunities to retry in order to develop proficiency and achieve quality in our work. Legendary football coach Vince Lombardi once quipped that "feedback is the breakfast of champions." Indeed, in every field of endeavor, feedback is the fuel for continuous improvement.

To serve learning, feedback must meet three criteria: it must be timely, specific, and understandable to the receiver (Wiggins, 1998). Feedback on strengths and weaknesses needs to be "just in time" in order to inform needed adjustments. Waiting two weeks to find out how you did on a test is not likely to help you improve on the tested area, especially if the class has already moved on to a new topic. Students also need specificity to help them understand the areas in which they need to improve. By themselves, grades (such as C+) and scores (such as 92%) fail the specificity test, and are no more helpful than generic comments such as "Good work!" or "Did you try your best?" Although positive remarks and top grades may make a student feel good, they do not advance learning in and of themselves.

Specific feedback sounds different, as in this example from a swimming coach:

> Your arms are relaxing well during the recovery; however, your underwater pull is stopping short so that you are not getting all of the power out of your arm stroke. Make sure that you pull all the way through until you feel your thumb graze your thigh before beginning your recovery.

Accompanied by a brief demonstration, the swimmer now has highly specific information to help his speed in the water.

Of course, it is important to be careful with our language, especially when giving feedback and guidance to younger learners. For instance, instead of saying, "Document your reasoning process," a teacher might say, "Show your work in a step-by-step manner so that a reader can see what you were thinking and follow what you did."

Here is a straightforward test for a feedback system: can a learner tell *specifically* from the given feedback what he or she has done well and what he or she needs to do to improve? If not, then the feedback is not yet specific or understandable enough to help the learner. In addition to timely, specific, and understandable feedback, learners must have the opportunity *and* the expectation to act on it (for example, to revise their explanation, to fine tune their argument, to practice and retry their performance, to rethink their approach to the problem). Providing feedback without a chance to use it is like eating without digesting. It does not make sense to spend time on formative assessments and giving feedback if we do not allow learners time to rethink and revise their work or performance. We need to include time for this—by design. A high school teacher told me that he always builds a "speed bump" into his unit plans to allow for the needed adjustments (such as reteaching, more practice, revision opportunities, and so on) that feedback reveals. He went on to say that he learned this from his experience as an athletic coach. This is not surprising since the essence of coaching involves ongoing assessment and feedback.

We tend to see the best feedback given in the performance-based subjects, such as career/technical education and the arts, and in extracurricular activities, such as drama, chorus, and athletics. Shouldn't feedback be a centerpiece of *every* classroom?

7. Encourage Self-Evaluation and Reflection

Before turning in their science lab reports, students review their work against a list of explicit criteria. On the basis of their self-assessments, a number of students make revisions to improve their reports before handing them in. Their teacher observes that the overall quality of the lab reports has improved since he started requiring students to evaluate their work before submitting it.

A middle school mathematics teacher periodically distributes "exit cards" in which he asks students to identify what is working

for them in his class and what isn't working. Students complete the cards, which he collects as they leave at the end of the period. He has found that this simple practice has dual benefits: (1) it gives the students an opportunity to reflect on their learning, and (2) it provides him with feedback to use in reflecting on his teaching. In fact, he has made several improvements to his instructional methods as a direct result of these student reflections.

Research findings in cognitive psychology, reading, and problem solving underscore the importance of metacognition in learning. Metacognition refers to processes by which learners think about their thinking, actively monitor their comprehension (Am I getting the author's meaning here?), employ and evaluate strategies (Is this approach working?), and reflect on their learning and set goals (How can I do better next time?). The second "E" in WHERE reminds us of the importance of regularly *engaging* our students in self-evaluation and reflection.

Metacognition has been characterized as a habit of mind involving an internal dialog or "self-talk" (Costa & Kallick, 2000). While this may occur spontaneously for some students, there is a recognized need to make the "invisible visible" for all learners. Here are ways in which teachers can explicitly cultivate the metacognitive capabilities of their students:

- At the beginning of the year, ask students to develop a personal profile of their strengths and weaknesses as learners (perhaps using a formal learning styles instrument). The students should consider how they learn best, what strategies work well for them, what type of learning is most difficult, and what they wish to improve upon (such as with goal setting). Then, include periodic opportunities for journaling when students can monitor their efforts, think further about their profile, and reflect on their struggles and successes.
- Use "think alouds" to model your own thinking process for your students. It is especially valuable to show them

what you do when you are stuck (such as when you do not understand a portion of text or get stuck during problem solving). Let them hear your struggles, your shift of strategy, your evaluation of progress, and so on. As learners become more comfortable with the process, you can ask them to think aloud and share their own thinking.

- Teach students to evaluate the same way that teachers are trained to be judges in Advanced Placement or statewide writing assessment. Ask them to score sample papers so that they will come to understand the meaning of the evaluative criteria and become more accurate as self-assessors.
- Ask students to include a self-assessment for every important product or performance that they produce. This can be easily accomplished when using a rubric or criteria sheet by adding a checkbox for the students to evaluate their work according to the listed elements. (See McTighe & O'Connor, 2005, pp. 15–16.) With practice, students become increasingly capable of honest criterion-based self-assessment.
- Periodically, have students respond to self-reflection questions, such as the following:
  - + What do you really understand about _____?
  - + What questions/uncertainties do you still have about _____?
  - + What was most effective in _____?
  - + How could you improve _____?
  - + What would you do differently next time?
  - + What are you most proud of?
  - + What are you most disappointed in?

+ How difficult was _____ for you?
+ What grade/score do you deserve? Why?
+ How has what you've learned changed your thinking?
+ How does what you've learned relate to the present and future?

Noted educator John Dewey once quipped, "We don't learn from experience, we learn by *reflecting* on it." Indeed, the most effective learners self-assess and reflect on their work, set personal learning goals, and employ proven strategies. Teachers help cultivate metacognition through modeling and by expecting students to apply these metacognitive habits regularly.

Classroom Indicators

This chapter has explored the general instructional implications of the UbD framework and suggested seven associated teaching practices. Let us conclude by considering what we would see in classrooms where these practices are in use.

Over the years, classroom observations have tended to focus on the teacher, often in the form of checklists or descriptors of teacher behaviors. Today, we see a growing emphasis on learner-focused observations in which attention is directed to what the students are doing—that is, the *effects* of the teacher's actions on learners and the learning process. Accordingly, I offer a set of observable indicators (see table 1 on pages 296–298) related to the seven instructional practices for both teachers and learners.

These indicators can be used for self-assessments by teachers, during classroom walk-throughs by school leaders, and as part of an induction/mentoring/coaching program. Of course, the entire list could be overwhelming, especially for a novice teacher or first-time observer. Thus, it makes sense to begin by focusing on a few selected indicators targeted to school priority areas or a teacher's professional growth plan.

Table 1: Observable Indicators of Suggested Instructional Practices

Instructional Practice	The Teacher	The Learners
1. Frame content instruction around big ideas and essential questions (EQs).	a. Posts EQs in the classroom b. Actively uses the EQs to frame instruction and learning activities c. Connects specific facts and skills to the big ideas and invites students to make such connections	• Can describe how the EQs relate to the content being studied • Can relate specific facts and skills to the big ideas
2. Frame learning around authentic assessment tasks requiring transfer application.	d. Frames the key learning goals in terms of authentic assessment tasks requiring learners to transfer their learning	• Can explain how the transfer tasks reflect the key learning goals (for example, "By doing _____, I will show that I have learned _____.") • Are engaged by the tasks because of their relevance
3. Help students know where the learning is going, why it is important, and how it will be assessed and evaluated.	e. Presents the learning goals at the start of a new unit or course f. Explains the purpose and relevance of the targeted learning g. Describes the major assessments that will show the extent of student learning h. Presents the evaluative criteria (for example, scoring rubrics)	Can answer the following questions: • What is the main learning goal in this unit? • How will this learning be assessed? Or, How will I show this learning? • How will my work be evaluated or my grade determined? • What are the qualities I am striving for in my work?

Instructional Practice	The Teacher	The Learners
	i. Shows exemplars of quality work along with examples of poor quality so that students can see the differences, and links the examples to the rubric	• How does today's work relate to the unit goal? How does it relate to what we have already learned?
4. Hook and hold student interest.	j. Begins a new instructional segment with a hook to engage student thinking, wonder, interest, emotion k. Uses hooks that directly link to important learning goals (not simply engaging activities)	• Are genuinely hooked and display interest, curiosity, excitement, puzzlement, laughter related to the targeted learning topic • Raise genuine and relevant questions about the topic as a result of the hook
5. Equip learners to come to an understanding and successfully transfer their learning.	l. Facilitates active meaning making on the part of the student m. Shows models of excellent work and expected performance (contrasted with poor examples or weak performances) n. Explicitly teaches needed skills and strategies related to the transfer performances	• Are actively engaged in comparing, summarizing, and generating graphic representations of key ideas • Work in cooperative teams on meaningful tasks • Have opportunities to transfer their learning to relevant situations
6. Provide opportunities for students to Rethink, Revise, and Retry based on feedback.	o. Provides specific and timely feedback in kid-friendly language p. Offers opportunities for students to revise their work, practice and retry a performance, or rethink an initial conception	• Can explain in their own words specifically what they have done well and what needs improvement based on feedback • Take the opportunities to revise, retry, and rethink to improve their performance based on feedback and results

continued on next page ↓

Table 1: Observable Indicators of Suggested Instructional Practices

Instructional Practice	The Teacher	The Learners
7. Encourage self-evaluation and reflection.	q. Provides regular opportunities for students to self-evaluate their learning process, products, and results r. "Thinks aloud" to model his or her own meta-cognitive processes s. Provides explicit instruction (when needed) on effective self-evaluation processes t. Provides guidance when needed (such as with prompting questions or a rubric) u. Provides opportunities for students to reflect on their learning and set future goals	• Can describe their preferred learning style and how they learn best • Regularly self-evaluate their learning process, products, and results • Reflect on their strengths and weaknesses as learners • Set future learning and performance goals

A Model for Engaged and Meaningful Learning

The Understanding by Design (UbD) model provides a curriculum design framework with an emphasis on developing understanding of big ideas and equipping students to apply their learning in realistic contexts. The seven instructional practices described in this chapter align with these goals. Their use makes it more likely that purposeful teaching will yield more engaging and meaningful learning.

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