By listening carefully to what students say and thinking deeply about how to better guide them, teachers can become accomplished formative assessors.

Formative Assessment in Seven Good Moves

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The research is clear: What teachers do in their classrooms matters. But which practices really make a difference? John Hattie (2012) conducted an extensive meta-analysis, looking at 800 meta-analyses that focused on locating a specific student achievement outcome and identifying an influence on that outcome. Formative assessment topped his list of the most influential practices that improve student outcomes.

What makes formative assessment so effective? It depends on whom you talk to. Although experts tell us that formative assessment is one of the most powerful ways to raise student achievement (Black & Wiliam, 1998), we don't always know *which* practices are most effective, *when* to deploy them, and *why* a particular combination actually worked for a particular student in a particular classroom. We often hear that the best feedback practices must be specific, addressable, timely, ongoing, and content-rich (Wiggins, 2012). But many beginning teachers and administrators don't have a clear idea of what these terms mean.

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For informed teacher educators, formative assessment is more than a checklist of qualities or collection of activities. Rather, it's made up of a sequence of *moves* that invite a positive, ongoing relationship between teachers and their students. It's the job of teacher educators to connect theory to practice and work with beginners to become better formative assessors.

Seven Essential Moves

Through watching hours of videotaped lessons and observing even more live lessons in middle and high school classrooms, my colleagues and I have identified seven basic moves that are essential to rich formative assessment practice (Duckor, Honda, Pink, Wilmot, & Wilson, 2012). These moves involve asking effective questions, giving students adequate time to think and respond, and asking probing follow-up questions that deepen student understanding. By practicing these moves, beginning teachers can develop into skillful assessors.

We created the names for these seven formative assessment moves to better describe to teacher candidates what we, as teacher educators, are looking for during observations in the classroom.

Move 1. Prime students first.
Priming sets the stage for all other formative assessment moves. Teachers will need to let the class know they'll be asking questions and calling on students in ways that students may be unfamiliar with. Questions will also prompt students to more deeply reflect on their classmates' responses and make new connections. Some students may experience this new classroom culture as strange.

For example, if a teacher follows up on a student's response by asking, "Can you say more about why that is?" some students might see this as a challenge or even a personal attack. A more positive follow-up question—such as, "I like this idea. Could you elaborate, explaining it in your own words?"—would more likely encourage a fuller and richer student response.

Thus, teachers need to establish norms and routines for inviting student participation, especially for students who aren't familiar with assessment practices outside the normal experience of "doing school." They also need to reflect on the various moves they do implement, whether it's increasing wait time or not having students raise hands to answer questions. By keeping notes on how the various approaches worked and with which students, we can agree on goals for the beginning teacher's next steps in becoming a more competent formative assessor (Duckor & Holmberg, 2013).

Like anthropologists doing fieldwork, teachers who are developing their skills in formative assessment are trying to understand and practice a new way of school life—for themselves and for their students. In the formative assessment–driven classroom, everyone is consciously engaged in practices that promote further learning, as opposed to those that merely assess student achievement (Stiggins, 2002).

It's not uncommon for students who have suddenly been immersed in this "foreign" classroom culture to ask questions like these:

- Why is the teacher asking "why?" so much?
- Why is the teacher using equity sticks (Popsicle sticks with a student's name written on each one) to call on us?
- Why is the teacher waiting a bit before taking answers, instead of just calling on Mary and John, who have their hands up?
- Why is the teacher putting *all* answers on the whiteboard, even the wrong ones?
- Why is the teacher always answering a question with another question?
- Why can't the teacher just solve the problem and write the correct answer on the board so we can move on?

Unfortunately, the literature on formative assessment provides few accounts of the culture shock many students experience when they're expected to learn in this new and perhaps puzzling manner.

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Move 2. Pose good questions.
Asking questions seems so easy. Teachers prompt students here and there to answer a few questions during a lecture, typically calling on just a few students to give the correct answer. Most students simply nod their heads while waiting for the teacher to get back to the lecture.

When it comes to effective posing of questions, the *kinds* of questions teachers ask matter. In the beginning teacher's classroom, questions often fall flat. Sometimes the questions imply a right/wrong dichotomy, which fails to invite or elicit a range of student responses. For example, "Can

someone give me the definition of mitosis?"

Other times, the questions are too open-ended. They tend to overshoot and intimidate students: "Why did the French Revolution occur?" "How do polynomial functions work?" "Can someone tell me what a thesis is?"

But some questions can promote thinking and learning. An effective question sizes up the context for learning, has a purpose related to the lesson and unit plan, and, ideally, is related to larger essential questions in the discipline. During a lesson on the civil rights movement (Gold & Lanzoni, 1993), a teacher at New York's Central Park East Secondary School asked students, "Should the integration of public facilities [in this scenario, a skating rink owned by whites] extend beyond the ruling on education addressed by the *Brown v. Board of Education* decision?" As the students worked to integrate primary sources into their oral arguments—and used words from those documents to make sense of such concepts as segregation, integration, and equality—they engaged in a lively give-and-take discussion. All the while, the teacher pushed back on their diverse responses, inviting deeper reflection.

Posing good questions requires that teachers *know their audience* and adapt questioning strategies to the responses of their students in real time. A well-posed question creates an opportunity to meet learners at their current level of understanding. Thus, formative assessors need to know (or at least anticipate) their students' learning progressions with complex material so they can scaffold questions at key points (pit stops and bottlenecks) in the unit.

Move 3. Pause during questioning. We all need time to process information, to "transfer files" from our short-term to our long-term memory and back again. Our processing speed varies according to the nature of the information we're asked to process and our degree of familiarity with it. That said, beginning teachers tend to feel uncomfortable with wait time between their questions and their students' responses. Moreover, they don't provide their students with enough protocols for participation, such as turn-and-talk, think-pair-share, or polling for opinions, all of which can provide the wait time needed to increase participation.

Formative assessors will ask questions and call on students in ways that students may be unfamiliar with.

Pausing requires preparation. A stopwatch, a smartphone, or a variety of audio or video devices can help track time between a question and a response. Teachers might also try counting out the pause in their heads. The goal is to slow the process down.

One low-tech solution to slowing down the question-and-answer exchange is to set up a think-pair-share and journal entry routine after posing a question to the class. Students can briefly talk to one another, then write out their responses in their journals, and then raise their hands to show they're ready to address the teacher's question.

In a heterogeneous classroom with language learners, students with special needs, and students with different learning styles, pausing can make all the difference. Giving students extra time to clarify their thinking gets more students into the discussion and makes teachers more aware of the level of understanding of every student in the class. In the absence of such information, the formative assessor doesn't even know where to start with follow-up questioning strategies designed to further elicit student thinking.

Move 4. Probe student responses. Too often, beginning teachers ask a question as though the answer to that question were obvious: "Does everyone understand?" "Did you copy the information yet?" "Can we move on now?" Or the teacher will ask a question that has a single right answer. As soon as one student answers the question correctly, there's no need for follow-up because "we" now have the correct answer. Compounding the difficulty, teachers may pose a question, get a correct response, and then silently wonder, "OK, now what do I do?" Thus the familiar, "Uh . . . good job!"

Probing suggests there's always more to know. Asking the standard questions (Who? What? Where? When? How? Why?) may lead to an initial set of student responses that satisfy the requirement for getting through the lesson in time for Friday's quiz. But formative assessment is more than a march toward the known. It's a process for uncovering deeper understanding, which means having access to evidence about what students are thinking.

For example, how can a teacher know whether a student truly understands why things sink or float without first posing the question and then probing a variety of possible responses? Research on buoyancy

misconceptions reveals that students typically think that big, heavy things sink and small, light things float; that hollow things float; and that sharp edges make things sink (Yin, Tomita, & Shavelson, 2008). After asking students why some things float and others sink, the teacher might ask, "So who thinks things float because they're hollow? Can you say why? Turn to your partner and ask for an example of a hollow thing that might sink."

Probing is about collecting more substantial evidence to make decisions about what to teach, reteach, or even preteach for a particular group of students. The more one learns about how real students in a particular classroom approach the material, the better one can guide them through the bottlenecks, cul-de-sacs, and eddies that will inevitably mark a student's progression toward an understanding of conceptually difficult material.

Move 5. Bounce questions throughout the classroom.

Feedback is about generating a loop. That loop can be represented by the connections or nodes of talk in the classroom. Too often, the loop is too small, occurring mostly between the teacher and a few eager students.

Beginning teachers often pounce on the first hand raised in response to a question. There seems to be an unbreakable bond between teachers who struggle to elicit the correct answer from their students and the small number of willing students who have that answer. Too often, the symbiotic relationship between these two or three students and the teacher leads to a false sense of feedback. When asked after a lesson, "So who seems to understand the objective of the lesson?" the beginning teacher typically recalls the answers that the hard-working, engaged students supplied.

Teachers can use equity sticks, index cards, or other tools to generate a "bounce" of responses across the classroom. They can even make notations on the seating chart to keep track of patterns of participation. By increasing the breadth and depth of student responses, the teacher is better able to draw meaningful conclusions about student understanding.

Without consistent procedures and visible practices related to "bouncing," or spreading questions throughout the classroom, there's little hope that the majority of the students will actually engage in thinking through a topic. We know from research on academic language and English language

development that providing opportunities for students to articulate their thinking—in a variety of productive modes—is essential. This practice also makes it more likely that all students will feel included in classroom conversations (Zwiers, 2007).

Move 6. Use tagging to generate a wide range of responses.

A biology teacher begins class by writing the word *cell* on the whiteboard and asking, "What is a cell?" Several students shout out their answers. The teacher says, "Not quite, but good tries"; writes the correct textbook definition on the whiteboard; and asks students to copy it into their journals. Bad move.

Tagging is recognizing student contributions to questions posed by the teacher (or other students). A simple tagging routine is the word web. Experienced formative assessors put a word up in the classroom, making it visible to all students—for example, "What is the first thing that pops into your head when you see the word *ratio*?" Then they ask students to write down their thinking. The word webs that emerge from these call-and-response brainstorming procedures encompass both on- and off-target responses, which all build a better picture of student thinking about the topic.

Sometimes it helps to have students turn to a peer and share a response or question orally before they write. Students might write a definition or draw a picture—whatever works to get their thinking started. The idea is to generate a wide range of responses.

Researchers point out that teachers are often uncomfortable with soliciting unorthodox or wrong answers (Black & Wiliam, 1998). Teachers may think that misconceptions could derail the discussion. Of course, misconceptions and students' prior knowledge are at the very heart of the learning process in a formative assessment–driven classroom (Shepard, 2000). If teachers don't create a space for students to express both their understandings and their misunderstandings, students who are too embarrassed to express a potentially incorrect answer will simply remain silent.

Move 7. Build your bins.

We come full circle with the seventh move, binning. If posing questions is the alpha, then binning is the omega move for the skilled formative assessor. Bins are how we teachers categorize student responses. We label some bins *correct answer,* others *misconception,* others *proficient*, and so on. Educational psychologists might refer to bins as mental schema for assimilating and accommodating new experiences. When students respond to a question, the teacher can potentially categorize, sort, and "bin" it for later use.

For example, beginning teachers often have difficulty hearing any

responses that don't fall into their *correct answer* bin. They're often unfamiliar with student learning progressions—how students work themselves through the building blocks of a big idea. In the science curriculum that deals with why things sink or float, for example, teachers should know about common student misconceptions related to mass, volume, density, and relative density. By failing to tag responses that evoke those misconceptions, teachers reduce the power of formative assessment to uncover difficult learning steps along the way. A teacher needs to know, through practical training and rich classroom experience, where kids get stuck and why.

How to build this teacher knowledge of different students' learning progressions, in relation to different topics and different levels of background knowledge, is one of the most important formative assessment challenges (Heritage, 2008).

Practice, Practice, Practice: On Making Good Moves

Our challenge as teacher educators is to plant the seeds of formative assessment in our preservice teachers so those seeds take root and flourish in these teachers' careers. Of course, beginning teachers are overwhelmed by many demands—classroom management, content-knowledge preparation, grading, and staying on top of their workloads, to name a few. Beginning teachers may also feel constrained by conflicting messages about what matters to students, parents, and administrators.

However, because formative assessment has such a great effect on student outcomes, beginning teachers need to take note. By practicing these seven basic moves, all teachers can develop the requisite expertise and become more skilled formative assessors. Research shows us that formative assessment makes a difference not only for student outcomes, but also for principals and teachers looking to build stronger relationships in their schools and classrooms. EL

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