

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.

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 hardworking, 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

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.

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